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ABSTRACT

Presented is a documentation, in detail, of the founding and development of the National Science Teachers Association (NSTA). It treats genesis and evolution of ideas within the organization, the development of positions and commitments on issues and alternatives. Accounts of a wide variety of actions of the NSTA during the period between 1944 and 1974 are provided. (Author/RE)

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THE NSTA STORY

A History of Ideas, Commitments and Actions

1944
1974

ROBERT H. CARLETON
NSTA Executive Secretary 1948–1973

NATIONAL SCIENCE TEACHERS ASSOCIATION
1742 Connecticut Avenue, N.W., Washington, D.C. 20009

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Preface

The National Science Teachers Association (NSTA) was born in Pittsburgh, Pennsylvania, on July 4, 1944. Unlike most infants at birth, the new organization immediately became an orphan because both its parents — the American Council of Science Teachers and the American Science Teachers Association — ceased to exist as of the same instant. NSTA, however, was blessed with a considerable number of nursemaids and several godfather groups, including the American Association for the Advancement of Science (AAAS) and the National Education Association (NEA). Imbued with hybrid vigor and nurtured by the vision, aspirations, dedication, and determination of a handful of leaders, together with a few dozen disciples, the nascent NSTA survived a shaky period of infancy, quickly conquered childhood growth pains, and matured into a prestigious organization whose voice and actions were accorded first-rank respect throughout the educational profession, among the various agencies of government, within the ranks of business-industry, and at the international level. Within a span of 30 years, NSTA

- grew to a member-subscriber roster of well over 40,000.
- purchased one periodical journal and launched two new ones, for a combined circulation of approximately 54,000 copies.
- conducted annually a national convention and several supplemental meetings, serving a total of more than 10,000 participants each year. (See Appendix IV.)
- designed and carried out a variety of programs to serve, recognize, and encourage youth with special interests and talents in science.
- included in its structure independent groups that served as Sections for special purposes in elementary school science,

teacher education, supervisory activities, and industry-education cooperation; in turn, the Association helped organize and charter an International Council of Associations for Science Education.

- developed an annual budget in excess of 1.5 million dollars.
- developed a headquarters staff of about thirty persons to perform the tasks included in professional activities, youth activities, publications, membership records and services, field services, and business affairs.
- moved from headquarters space in the president's home to a succession of space assignments at the NEA center in Washington, D.C. and thence, in July 1974, into the Association's own, newly purchased building in the national capital.

The purpose of this volume is to record in some detail the genesis and nurture of ideas, the development of positions and commitments on issues and alternatives, and the great variety of actions that collectively comprise "The NSTA Story: 1944–1974."

The story is told pretty much in first-person reporting, the reason being that I was involved in practically every facet and development of the NSTA endeavor right from the very beginning — from being present as a voluntary, interested observer at the founding meeting in Pittsburgh in July 1944, to serving on committees and as an officer during 1944–48, and serving as executive secretary 1948–1973. And now seems the appropriate time to record my great admiration, respect, love, and appreciation for the hundreds, the thousands of persons with whom I worked during those last 25 years — the presidents and other officers, the three hundred or so members of boards of directors, several hundred committee members, headquarters staff personnel, school and college students, professional colleagues and counterparts in other organizations, representatives of companies and other groups that advertised or exhibited with us, dozens of wonderful colleagues and friends in other countries, and last but most important of all — thousands of members encountered during field trips and at our conventions and meetings. I feel quite certain that no other person in the history of science education can have had the opportunities, rewards, and satisfactions that were my pleasure through the NSTA experience, preceded of course, by 20 years of teaching in junior and senior high schools and in three different colleges and some fairly successful textbook writing. For all these things, I am

deeply grateful; I am indebted to colleagues and to the profession beyond any ability to compensate. I can only hope that through 45 years of professional activity, I did serve and "feed back" in manner and measure an effort reasonably commensurate with my own rewards.

I have avoided, on good advice, making this NSTA story a year-by-year chronological recital of events. I have tried to identify major theaters of activity, major lines of endeavor, and to treat these in a developmental manner. I have tried to make the chronicle readable and interesting, assuming that there will be at least a few readers who will want to be entertained as well as informed. Personal viewpoints, evaluations, opinions, and hindsight — yes, even some egoisms — have crept in here and there, but I have tried to be factual. In addition to relying on memory, I have reviewed in detail the minutes of more than one hundred meetings of Executive Committees and Boards of Directors, also the NSTA Activities columns and other such reports in more than one hundred issues of *The Science Teacher*.

The NSTA story is indeed a record to be proud of. As I said in remarks at my retirement banquet at the 1973 national convention, NSTA's greatest achievement is perhaps that of bringing together elementary, secondary, and college classroom teachers, teacher educators, supervisors, business-industry educators, and many other representatives for common-cause endeavor in behalf of better science education — not for the sake of the various disciplines or even of "science" broadly conceived but, rather, for the sake of the children, youth, and others with whom we work in the realization of how science can contribute to the enrichment of personal, communal, and societal living.

Anyway, the record of 30 years is written. If indeed the past is but prologue to the future, the next two or three decades of NSTA history should be another glorious chapter. My closing words in this Preface are expressions of deep appreciation to five persons whose assistance to me in the preparation of this work was invaluable:

First, to Philip G. Johnson, first President of NSTA (1944-46), whose accumulation of records of the pre- and early years of NSTA proved to be a treasury of pertinent information not readily available elsewhere and who provided other information and recollections that helped keep the record straight on many points throughout 1944-74;

Next, to Esther Patterson, a long-time secretary on the NSTA headquarters staff and currently Administrative Assistant to the Executive Director, who researched many questions of record, checked and verified or corrected dozens of factual items, and supervised the preparation of manuscript;

Also, to Corene Patterson Hicks, Esther's daughter, who typed more than 400 pages of manuscript promptly and at a rate of better than 99 percent accuracy;

Then, to Leslie W. Trowbridge, the last President of NSTA under whom I served (1973-1974), who read every word in this opus, reacted, raised questions, and proffered suggestions that helped clarify, smooth out, and otherwise improve my first effort;

Then to Mary E. Hawkins, Publications Manager and Editor of *The Science Teacher* from 1963 to 1975, who interrupted retirement to edit this manuscript and prepare it for publication;

And finally, to Dorothy J. Carleton, my wife, who lived through it all, endured the travels and travails of an Executive Secretary husband, participated in NSTA activities to the point of knowing a thousand or more members on a first-name basis, and — to cap it off — was called on to react and advise upon and listen to my reading rendition of the written record.

Silver Spring, Maryland
November 1975

Robert H. Carleton

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The Seminal Years

The National Science Teachers Association did not suddenly emerge "out of the nowhere into the here." On the contrary, a national organization for science teachers that would unify elementary, secondary, and college teachers and other wings of the profession was more than a gleam in the eyes of several leaders for at least a decade prior to July 4, 1944. That was a decade of troublesome but thought-provoking times. The country was struggling to come out of the greatest depression in history. The depression abroad bred demagogues who resorted to belligerent actions in Europe, Africa, and Asia. The United States teetered on the brink of war and ultimately became involved in the most terrible, devastating war of all time.

Education, too, during this decade, was a swirl of seething ferment. The school-leaving age was being increased everywhere, primarily as a means of keeping youth off the streets in the absence of jobs and not because of any profound recognition of or belief in the powers of education by boards of education across the land. This resulted in a tremendous increase in the high school population, and questions of what to do with all these "non-college" students clogging our classrooms and corridors? The writings of John Dewey, George S. Counts, Boyd H. Bode, John Kilpatrick, Henry C. Morrison, and others of their time added fresh yeast to the brew, proposing, as they did, that schools, curricula, and modes of instruction be changed, even drastically, so as to focus on the needs of students, the ways by which young people learn, and the socioeconomic problems of the times. The Progressive Education Association was formed; the Eight-Year Study[1] was concluded and reported out (but, I always felt, not widely or deservedly read and pondered; in my opinion, this is "must"

[1]Progressive Education Association, Commission on the Relation of School and College, *Adventure in American Education*, Vol. 1-5, New York, Harpers, 1942.

reading for prospective teachers to this day). The child-centered curriculum, education *for* life and living, education *as* life and living, and progressive education (meaning, usually, everything the stand-patters objected to) were words of education batted, battered, and bent, back and forth, in the public press, in publications of the profession, and in the faculty rooms (seldom co-ed) of the schools.

Science education did not, could not, escape the heat of controversy (or, shall we say, the stimulation of challenge and uncertainty). S. Ralph Powers and Gerald S. Craig at Teachers College of Columbia University, Francis D. Curtis at the University of Michigan, Charles J. Pieper and Wilbur Beauchamp at the University of Chicago, Frank C. Jean at State Teachers College at Greeley, Colorado, Anita D. Laton at the University of California, Berkeley, and others whose names I apologize for omitting were leaders in questioning the then "standard curriculum" in science. This, almost invariably, was a sequential offering of general science in grade 9, biology in grade 10, chemistry in grade 11, and physics in grade 12 (the latter two commonly alternated in either grade 11 or 12 in the ten or twelve thousand schools of, say, 300 or fewer students). However, the nature of the courses, particularly chemistry and physics, was probably of more import than their sequence or names. General science and biology tended to emphasize health, environment, community problems, transportation, communication, and conservation. The leading textbooks in these fields were authored principally by secondary school teachers and/or professors in colleges of education. Chemistry and physics, on the other hand, were essentially introductory versions of the first-year college courses, and the textbook authors were preponderantly college professors of the same subjects.

Somewhat indicative of the dialogues of the mid-30s, John Dewey in an address at Boston in 1933 pointed to the great production of new scientific knowledge and the tremendous momentum in methods and the desire for still more knowledge. He deplored what he regarded as a huge, unbridged gap between the methods and products of the scientific endeavor and the public's understanding of science. Turning specifically to science teaching in the schools, Dewey said:

> The obligations incumbent upon science cannot be met until its representatives cease to be contented with having an unrelated multiplicity of courses in various sciences represented in the schools, and devote even

> more energy than was spent in getting a place for science in the curriculum to seeing to it that the sciences which are taught are themselves more concerned about creating a certain mental attitude than they are about purveying a fixed body of information or about preparing a small number of persons for further specialized pursuit of some particular science.[2]

Pleading that the needs of "superior students" must be provided for in any school science program worthy of its name, Ralph E. Horton of Seward Park High School, New York City, wrote as follows for the *Secondary Education Bulletin* of the Department of Secondary Education (NEA) in 1935:

> The understanding of chemistry, physics, or modern (advanced) biology requires intelligence asserted to be possessed only by the upper 20 percentile of the population. This demands ability to think in terms of mathematical concepts and in abstract ideas. Students who possess these abilities should be given intellectual meat and not soup. They should be stimulated to work and not allowed to dawdle or mark time on easy tasks which were adjusted to lower levels of ability.

By the late 1930s a number of science textbooks had appeared which, in the authors' experience and best judgment, offered promising alternatives to some of the "standard" science courses as appropriate for the "non-college" students. Under such titles as consumer science, senior science, (general physical science, living chemistry, and (everyday) experiences in physics, these new courses rapidly gained acceptance and by 1940 enrolled some fifty thousand students, mostly in grades 11 and 12.

But there was much skepticism and opposition throughout the land; these courses were "intellectual soup" to the critics, they were "watered down" science hardly worthy of the name. Controversy was growing. And then, suddenly, the picture changed. Came Pearl Harbor, the United States was in a war, and "the war effort" conditioned and directed every facet of American life and activity — including the schools and science teaching. Soon recognized as "the physicists' war" with heavy reliance on scientific-technological superiority for victory, science promptly became the fair-haired subject in the school curriculum (mathematics, too, but to a lesser extent). The focus of science teaching shifted dramatically toward meeting the needs of the Armed Forces (always capitalized, of course). The emerging new courses dropped out of the curiculum; "solid science" and a host of "pre-induction" courses came in. We had preflight aeronautics and several short courses (usually one semes-

[2]From "The Supreme Intellectual Obligation"; *Science Education*, February 1934.

ter) in fundamentals of machines, electricity, meteorology, and radio and electronics. By 1945 or so science in the schools was accorded a pre-eminence that carried through the next twenty-plus years, including the NSF "alphabet soup" projects and the "megabuck" budgets provided by the National Science Foundation and certain private agencies.

Though there were several weak science teaching groups, science teachers of the 1930s, in terms of their organizations, were ill prepared to cope with the problems, concerns, and controversies swirling all about them, much less exert a leadership role. Certainly the organizations were totally unprepared and impotent to cope with the national emergency resulting from the war. A somewhat detailed review of the situation at that time and of ideas, proposals, and actions in sequence is, I believe, essential to an understanding of how NSTA came into being, with certain purposes, directions, and commitments clearly delineated. For this purpose, we go first to the records of the 40th anniversary meeting of the Department of Science Instruction of the National Education Association at Denver, Colorado, July 1-3, 1935.

The general theme of the meeting was: A Continuous Program in Science for the Elementary School, the Junior and Senior High Schools. The Denver program was planned by a committee chaired by F.C. Jean, Head of Science Division, State Teachers College, Greeley, Colorado.

President of the NEA Department of Science Instruction was Ira C. Davis, Professor of Education and Head of the Science Department of the University High School, University of Wisconsin, Madison. He also served in this role for another year, 1935-36 and, as we shall see, may well have been the instigator of the movement culminating in the formation of NSTA. In the Foreword to the volume of the *1935 Proceedings* of the Department, NEA president Henry Lester Smith, Dean, School of Education, University of Indiana, Bloomington, wrote as follows:

> The foundations for the splendid group meetings held recently at Denver by the Department of Science Instruction were laid in the same city forty years ago. In 1895 the science teachers of the nation became a Department of the National Education Association at its convention in Denver. [Author's note: NSTA was seventh oldest among, ultimately, about twenty-five NEA Departments.]
>
> To estimate progress in the teaching of science on this fortieth anniversary one has only to leaf thru the minutes of that early meeting as recorded in the NEA Proceedings for 1895. The leaders of that day had to

> build from the general, outline courses of study, secure textbooks and laboratory equipment, and most difficult of all, provide teachers who were prepared in these new fields.
>
> The groundwork has been well laid. No one can estimate the effects of the year-by-year teaching of the scientific method of problem solving in our high schools and to a lesser degree in the elementary schools. Our national inventive genius has been especially stimulated by the laboratory method of teaching science in the high schools. ...
>
> With foundations established, how to relate scientific teaching to out-of-school life has become a major concern. How can we teach young people to apply the methods of scientific thinking which they have learned in school, to problems of government, industry, and agriculture? ... The future of our nation depends on what we do in the schools today. As education goes so civilization goes — up or down. [Author's note: That's educators and science teachers for you — always the weight and fate of the world on *their* shoulders.] May the science teachers of our nation continue their arduous task of clearing social vision as to desirable future pathways and in training the youth of our country to support us in our progress along those pathways.

The following program excerpts will indicate the kinds of concerns deemed important in those days, at least to the program committee for that 1935 meeting.

"The Needs and Provisions for Universal Science Education"; Otis W. Caldwell, Teachers College, Columbia University and General Secretary, American Association for the Advancement of Science

"Science in the Elementary Schools of Cleveland, Ohio"; (Also, of Austin, Texas; Tulsa, Oklahoma; and Denver, Colorado)

"Elementary Science Needs and Outdoor Laboratory"; Esther W. Scott, Supervisor of Elementary Science, Washington, D.C.

"Research Program to Determine Grade Placement of Subject Material"; Ralph C. Bedell, State Teachers College, Kirksville, Missouri, and chairman, Research Committee, Department of Science Instruction

"A Basis for Critical Evaluation of the Present Programs in Junior High School Science"; Anita D. Laton, University of California, Berkeley

"A Basis for Critical Evaluation of the Present Programs in Senior High School Science"; J.H. Jensen, State Teachers College, Aberdeen, South Dakota

"Science in the Future Junior College"; William J. Bogan, Superintendent of Schools, Chicago, Illinois

"The Social Significance of Science Instruction"; Ernest E. Bayles, University of Kansas, Lawrence

"Reception-Banquet and Fortieth Anniversary Celebration"

At the banquet session, a Mr. William Triplet read a prepared paper titled: "The organization of the Science Division of the NEA-1895." In the record, he is identified only as a charter member who attended the 1895 meeting of the NEA in Denver at which the Department was organized. Here is his paper, reproduced in full not only for its NSTA-related historical content but also for the glimpses it provides of problems and concerns in science teaching at the turn of the last century.

The Organization of the Science Division of the N.E.A. Denver — 1895[3]

By William Triplet
Charter Member 1895

(Mr. Triplet attended the meeting at which the department was organized at Denver in 1895. He read this paper at the Fortieth Anniversary Celebration Banquet at Denver, July 2nd, 1935.)

At the meeting of the Colorado State Teachers' Association in December, 1894, there was organized a State Department of Natural Science Teachers. This association developed a great interest in the improvement of natural science teaching in high and preparatory schools. By the advice of the officers of the National Educational Association, announcement was formally made of two public round table meetings of natural science teachers, at the Lutheran church, corner of California and Twenty-second Streets, for 2:30 p.m., on Wednesday, July 10, and Friday, July 12, 1895.

At the first meeting, Dr. Charles S. Palmer of the University of Colorado was made chairman and Mr. Charles L. Ling of the Denver Manual Training School was made secretary. Dr. Palmer then introduced Dr. Nicholas Murray Butler, president of the National Educational Association. Dr. Butler spoke of the sympathy with which the movement was viewed by the officers of the general association, and said they were heartily united in wishing for the new department unbounded success. He said it had taken four-hundred years to organize science into its now accepted subjects. "Indeed," he said, "only since Darwin and Helmholtz have the ideas of science been clarified and classified."

Professor Bessey, of the University of Nebraska, stated that he did not believe in biological science, but in botany, zoology, physiology, etc.

Professor George S. Atkinson, of the Department of Cryptogamic Botany at Cornell University, read a paper on Botany and Zoology in the Secondary Schools. He doubted the advisability of recommending compound microscopes for all students.

Professor W.S. Jackman, of the Cook County Illinois Normal School, spoke on the "Teaching of Natural Science in the Grades below the High School."

Mr. Otis Ashmore, of Savannah, Georgia, spoke of his experience in taking his high school class to the seacoast on a scientific excursion.

The election of officers for the department resulted as follows:

For President — Charles E. Bessey, Lincoln, Nebraska
For Vice-President — Wilber S. Jackman, Chicago, Illinois
For Secretary — Charles S. Palmer, Boulder, Colorado

[3]Published in the NEA *1935 Proceedings*, pp. 84-86.

At the opening of the second session, July 12, 1895, the president introduced Dr. Joseph Le Conte of the University of California. Dr. Le Conte said, "Now we witness another revival of learning. Now we find a new method; the laboratory and the field — the keys which will unlock nature. Science shows that the best cultivation of mind comes from the study of nature. The Department of Natural Science Teaching in the National Educational Association is as important as any department in the association. When we consider the newness and uniqueness of the scientific method, if any department is to be recognized, surely the Department of Natural Science should be."

Mr. Lewiston spoke of the use and uselessness of definitions and recommended the ignoring of atoms and molecules as far as possible. He had used the "sandwich plan" of interspersing chemistry and physics and found it worked well. He recommended correlation in science in the grades.

Professor Palmer said that college teachers can no longer ask pupils to wait for college to begin science. He maintained that the sciences build up the best and strongest character, if they are well taught.

Mr. Garvin of the East Denver High School quoted at length from the most admirable report of the Chemical Committee of the Colorado State Science Teachers, and recommended physics first and chemistry afterwards; one year to each; seven hours per week; two periods of two hours each, etc.

Mr. Ling of the East Denver Manual Training High School favored physics first and chemistry afterward.

Mr. Twiss of Cleveland preferred chemistry first and physics afterwards.

Professor Strong, of the University of Denver, would teach physics first.

Professor Skidmore of Philadelphia said he regularly "sandwiched" physics and chemistry.

Principal Wise of South Denver said he had found best results by teaching physics and chemistry together, without the use of a special textbook.

Mr. Coudry, of Lincoln, Nebraska, preferred physics first and chemistry afterwards. He said Botany and Zoology should be taught incidentally.

Mr. Turner of Omaha, preferred physics first.

The committee appointed to present the matter to the Board of Directors of the National Educational Association proceeded at once, with Professor Le Conte as their spokesman, to urge the petition. The petition was unanimously granted and thus the round table with its officers became the Department of Natural Science Instruction of the National Educational Association.

Excerpts from minutes of Round Table meetings written by Dr. Charles Skeele Palmer, Professor of Chemistry, University of Colorado, Boulder, Colorado.

Forty years ago it was a common assertion that scientific knowledge is of most worth. The science question was dominant then. Teachers were aggressive. Laboratories were established everywhere. The idea was extended into other fields. Literature was taught by the laboratory method. Then it was thought a well-rounded out course should include:

4 years of Mathematics, 4 years of Science, 4 years of History, 4 years of English, 4 years of Latin, 4 years of German.

This was a strenuous regime. It required hours of home work and outside study. There was little time for play. Then the idea of work, discipline and training was pushed to the forefront. Then the idea was to prepare for life. Ends were attained by main strength.

> Now the idea seems to be to live, to be interested, to be amused. Now the advantages of work, discipline and training are questioned. The course has been extended and enlarged, enriched, enlightened, enlivened and probably made more pleasing. It is believed by some that now the school has become more nearly what it should be, a nursery to aid and assist and relieve the home, to the end that the home may more largely participate in social functions. Now the student can go to his study, turn on the radio, take an armful of books, curl up on a soft couch and soon have all his lessons prepared for the next day. Now the automobile carries the student to school, rested, alert, aggressive and in a fit condition to contend.
>
> Then or Now?
>
> Sir Roger would say something might be said on both sides of the question.

And that is how, when, and where the earliest component antecedent of NSTA was formed. Its year of birth coincided with that of the Science Teachers Association of New York State (STANYS) and preceded the founding of the Central Association of Science and Mathematics Teachers (CASMT) by five years. Are there any other science teacher organizations in the United States, established before 1895 and in continuous operation ever since? I know of none, but the record should be corrected if such there be.

Skipping over the intervening years, we now return to 1935. The reason is to quote certain excerpts from the then operational Constitution and By-laws of the NEA Department; to wit:

> *Article II – Objects and Purposes*
>
> Section 1. To encourage the teaching of science in all levels in schools through a continuous, integrated program of science.
>
> Section 4. To provide group meetings of teachers of science of elementary, junior, and senior high schools and colleges for promoting the development of science curricula and practice as a part of the local, state, and national organizations.
>
> *Article III – Membership*
>
> All members of the National Education Association interested in science shall be eligible to become members of this department upon payment of the fee. [Author's note: This requirement of NEA membership as prerequisite for membership in a department continued to haunt and trouble NSTA and most other departments all the way through the 1960s. When NSTA was organized in 1944, the requirement of NEA membership as a condition of joining NSTA was omitted. When the headquarters office was established at NEA in 1948, Willard E. Givens, the NEA Executive Secretary, assured us that the NEA by-law requiring such NEA membership "will be quietly overlooked; do all you can to encourage NEA membership by your members and there will be no problems." That was true for many years.]
>
> *By-laws Article V – Membership Fee*
>
> The membership fee shall be twenty-five cents. This fee must be paid before August first in order to receive the current Yearbook and announcements.

The *1935 Proceedings* (Yearbook) also carried the following message to members and, it was hoped, to other "unwashed" science teachers who would be persuaded to join the organization.

What Twenty-Five Cents Gives to Each Member in the Department of Science Instruction of the National Education Association[4]

1 Generous support by the National Education Association.
2 Membership in the largest organization of Science Teachers for the Elementary and Secondary schools in the United States.
3. A copy of the program to be given at the annual meeting before the meeting is held. The programs will be mailed to paid up members about May 15.
4. A copy of the proceedings and papers given at the annual meetings of the department. Copies will be mailed about September 15 each year.
5. Permission to attend all meetings of the Department.
6. An opportunity to help the Department develop a continuous program in science for the elementary school, the junior and senior high schools.
7. An opportunity to make known to others the teachers and schools that are rendering real service to science teaching.

In order to keep the membership fee at twenty-five cents, it is essential that all members cooperate by sending their dues promptly to Miss Esther Scott, Oyster School, Washington, D.C. Please get at least three other members and send their names and addresses with your membership to Miss Scott. She will mail each a membership card.

Correspondence and suggestions are always welcome.

Sincerely yours,
Ira C. Davis.

The Department apparently followed a business-as-usual course during 1936, 1937, 1938, and 1939; meaning that officers were elected by members in attendance at the annual meeting always held in conjunction with NEA, and a volume of *Proceedings* of the meeting was published by NEA and distributed to Department members ("to more than 4600" was claimed in 1936). Little or nothing more was done (at least by way of membership services or activities) until the next meeting a year hence, except for the appointment of two or three committees. But perusal of the *Proceedings* for these three years does reveal what I regard as some noteworthy productions. First would be a number of addresses given at the annual meetings by influential leaders of the times, including: "Shall the Desirable Objectives Be the Basis for the Selection of Subject Matter?" by Francis D. Curtis, University of Michigan (*1937 Proceedings*); "The Subject Matter of Science Should Determine Objectives" by

[4]NEA *1935 Proceedings*, p. 153.

Carleton E. Preston, University of North Carolina (*1937 Proceedings*); "Some Essential Factors to be Considered in Developing an Elementary Course of Study" by Mary Melrose, Cleveland, Ohio, Public Schools (*1937 Proceedings*); "Functional Values of Science" by Charles J. Pieper, New York University (*1938 Proceedings*).

The second kind of productive effort during these years, and far more germane to the NSTA story, was a series of committees appointed and the reports they issued. In 1936 a Department Committee on Policy and Research submitted "A Proposed Statement of Principles Basic to Instruction in the Natural Sciences," which appears in Appendix I.

The Committee on Policy and Research was perhaps deemed notable for the "big names" included in its membership. Also noticeable, however, if not notable, about the committee, there was no representation on it from the ranks of precollege classroom science teachers. Yet it did produce a statement that considered science as both organized knowledge and a method for obtaining such knowledge and related science instruction to society, national traditions, and educational growth.

A new standing committee on Investigation and Reorganization of the Science Program was appointed during 1937-38; Ira C. Davis was the chairman. By 1939, this committee apparently was replaced by a National Committee on Science Teaching, again chaired by Ira C. Davis. There were subcommittees as follows: Philosophy or Frame of Reference, Nathan A. Neal, chairman, James Ford Rhodes High School, Cleveland, Ohio; Evaluation, Carleton E. Preston, chairman, University of North Carolina; Social and Personal Needs in Relation to the Science Program, W.C. Croxton, chairman, State Teachers College, St. Cloud, Minnesota; Teacher Education, S. Ralph Powers, chairman, Teachers College, Columbia University; Administrative Problems, Ira C. Davis, chairman; and Materials for the Teaching of Science, Ellsworth C. Obourn, chairman, John Burroughs School, Clayton, Missouri. This time around, two of the subcommittees were chaired by high school teachers.

We must now take time and space to look at the work of these early committees in some detail, because they and the 1939 National Committee set in motion ideas and commitments that resulted in the publication of three landmark documents in 1942 and in the foundation of NSTA in 1944. Also, supporting

the work of the National Committee was the first direct, monetary assistance from the NEA in the form of a grant of $1,000 — big money in those days. It should also be pointed out and emphasized that the National Committee was organized under auspices of the NEA Department with cooperation of the following other organizations:

American Association for the Advancement of Science
American Chemical Society, Division of Chemical Education
American Nature Study Society
American Science Teachers Association
Association of Science Teachers of the Middle States and Maryland
Central Association of Science and Mathematics Teachers
National Association of Biology Teachers
National Association for Research in Science Teaching
National Council on Elementary Science
National Council of Geography Teachers

The idea behind this National Committee and its purposes, goals, and mode of operation are set forth in the following statement prepared by chairman Davis and published in the *1939 Proceedings* of the NEA Department.

The Organization of the National Committee on Science Teaching[4]

The common talk at conventions of science teachers' associations the past few years has been the need of a National Committee on science teaching. Many recognized that we had a large number of associations working independently of each other and many times at cross-purposes with each other. Practically all of these teachers wanted to know why these associations were not cooperating with each other to solve the large number of problems so urgent in science education today. ...

Enough of you are members of different associations to realize the importance of finances. None of the existing organizations of science teachers is in a position to finance the activities of a national committee for a period of two or three years. If all of these organizations pooled their financial resources, they still could not undertake such a venture. ...

The officers and members of the Department of Science Instruction had discussed this problem several times. ... Other organizations were consulted to get their opinions and suggestions. A few suggested we might attempt to interest some of the Education Foundations or Boards in financing a science committee. Some objected to this procedure. However, there was unanimous agreement that the National Education Association was the organization that should sponsor such a committee. This Association has approximately 200,000 members, is well financed and managed, and is genuinely interested in initiating and promoting new developments in education.

[4]Published in the *1939 Proceedings*, Department of Science Instruction-NEA, pp. 5-12.

The Department of Science Instruction made a formal request to the Executive Committee of the National Education Association for funds two years ago. The request was accepted in principle at that time, and last year a fund of $1,000 was provided for the organization of the science committee and for continuing its work for one year. Up to this time the National Education Association had pursued the policy of paying only the expenses of chairmen of committees and not members of the committees. We had requested expenses for five or six members of such a committee, so our science committee has been able to overcome one tradition in regard to expenses of members of committees.

Now that the money was available, what plan should be followed in organizing a national committee on science teaching? Certain definite principles were set up and agreed upon. These principles were unanimously accepted by cooperating groups.

First: That the committee should be organized and conducted on democratic principles. The whole procedure should be a real demonstration of democracy in action.

Second: The Committee should be a real national organization of science teachers. Every organization of science teachers should be given an opportunity to cooperate by having a member on the general committee or by having a consultant on one of the subcommittees.

Third: The Committee should develop a program in science teaching for grades one to fourteen inclusive through the inductive or problematic approach. This means that the program, when developed, will be based on the opinions, beliefs, and judgments of a large group of teachers after a careful discussion and consideration of all available evidence. In other words, no one is interested in forcing through the committee any preconceived notion of a fourteen year program in science. Many teachers have their points of view and plans, but all are willing to submit them for consideration in competition with other plans or points of view.

All national organizations of science teachers were invited to select one of their members to represent them on the general committee. ...

The members of the general committee represent associations having more than 30,000 members. The members of the committee come from eleven different states from California on the west to New York in the east and from North Carolina on the south to Minnesota on the north.

The members were selected for the general committee

(1) For their standing or reputation in the field of education, especially science education.
(2) For their contributions made to science education literature.
(3) For the number of teachers of science they could contact through conferences and discussions.
(4) For the secretarial help they could get at no expense to the committee.
(5) Because they could get permission to attend committee meetings on school time with no expense being charged to any organization or teacher for loss of this teaching time.
(6) Because in some cases they could get a decrease in teaching load or a promise of it in the future.
(7) Because they have been or are now successful classroom teachers.

It is necessary to have one general committee with a relatively small membership if any satisfactory progress is to be made. It is also essential to have these members attend all meetings of the committee. However, this general committee must be in a position to reach out and get a large number of teachers to cooperate with it. The general committee then becomes the policy-making and policy-forming committee. It should be

in a position to evaluate all of the contributions made by the large number of cooperating groups.

In order to get a large number of cooperating groups, each state, district, or local group of science teachers was invited to select a consultant to cooperate with the general committee. At the present time we have more than 150 consultants from 43 states. The number will be enlarged as we find additional science teachers who can represent geographic areas not now represented or teachers who can do specific tasks the general committee desires to have done. Any science teacher who really wants to cooperate with the committee will be welcomed as a consultant.

The total membership of science teachers represented by members of the general committee and by consultants is in excess of 50,000. For this one reason I believe we are justified in saying we have a representative national group of science teachers cooperating in developing a program for science for grades one to fourteen.

The members of the general committee feel we should solicit the advice and suggestions of other associations which are in a position to help us. An extensive and thorough consideration of all phases of new science program from all points of view should help to make it more practical and workable. The associations now cooperating are:

Educational Policies Commission
Society for Curriculum Study
Association of Teachers Colleges
National Association of State High School Supervisors and Directors ...

The general committee agreed on a five point attack. ... Five sub-committees were selected as follows—

Sub-committee on Philosophy or Frame of Reference or Point of View — Nathan A. Neal, Chairman.
Sub-committee on the Personal and Social Needs of Children — W.C. Croxton, Chairman.
Sub-committee on Evaluation of Methods, Materials, and Results of Teaching — Carleton E. Preston, Chairman.
Sub-committee on Teacher Training — Professor S.R. Powers, Chairman.
Sub-committee on Administrative Practices — Ira C. Davis, Chairman.

All members of the general committee and consultants have been assigned to one of these sub-committees. ...

A careful and thorough survey of all of the problems the committee might consider in developing a fourteen year program in science was made before the meeting at Cleveland in May. This two-day meeting at Cleveland was devoted to two meetings of the general committee, several meetings of each of the sub-committees, and several joint meetings of all committees.

I believe I am not overstating the case when I say that the group attending this meeting at Cleveland was the most representative, the most capable, and the most genuinely interested group of science teachers that has ever met together in the United States. Forty-six teachers were present. These teachers are in direct contact as heads of departments, supervisors, or directors with more than 12,000 science teachers. They came from eighteen different states.

Real progress was made at this meeting. Issues were clarified. Problems were more accurately stated, defined, and delimited. New problems arose which had not previously been considered. It was quite evident that this group was really interested in assuming the leadership in this new program for science. It was a real inspiration to me to see so many science

teachers willing and eager to work together cooperatively and democratically on a problem that was of such vital concern to all of them. ...

I have attempted to give you, as briefly as possible, the activities and progress of the National Committee on Science Teaching to date. No doubt I have not answered all of the questions you have raised in your minds. Possibly I have not overcome the resistance some teachers seem to exhibit in opposition to such a venture.

What are the greatest difficulties the committee has encountered and will continue to encounter in the future?

1. The getting of funds to carry on the work. We have requested a considerably larger budget this year than we had last year.
2. Reaching a larger number of teachers of science and getting them to believe this is a real cooperative venture. We need now more leaders for groups in some of our larger cities or in other areas in which different groups might work together. We need more consultants who will really assume leadership and responsibility. People who can persuade Boards of Education that this new work is so valuable that teachers should be relieved of some teaching duties, be provided some secretarial help, and have their expenses paid to the meetings of committee. We could use fifty to one hundred more consultants if we could locate them.
3. Getting teachers to feel they have a certain degree of responsibility in developing this program. The committee has no desire to make a plan of its own and force it on teachers. What the committee wants is the opinions, belief, plans, philosophies of teachers so they can work with them to get a new program.

To me, these are the issues and opportunities we must face as science teachers—

Can we work together cooperatively and democratically?

Are we willing to assume leadership in demonstrating how science can contribute to a better democratic mode of life?

Are we willing to face the facts concerning the results of instruction in science and in education in general?

Are we going to insist on teaching science for subject matter alone? Can we justify the statement any longer — study science for the sake of science alone?

Are we willing to undertake the reorganization of our whole program of science education if a new kind of organization will better fill the needs of children? In other words, are we willing to organize schools for boys and girls rather than for subject matter?

Are we willing to work together to discover what the personal and social needs of children are? Are we willing to base our evaluation program on the acquisition of desirable social outcomes rather than the acquisition of facts and principles?

Are we willing and eager to be scientific in teaching science?

Can teachers work together cooperatively in improving their teaching?

At the 1940 meeting of the Department in Milwaukee, a report from the National Committee recommending that "the Department of Science Instruction expand its functions to form a National Council on Science Teaching which would have an executive secretary in the NEA building in Washington and would endeavor to issue a magazine of real value to science teachers" was passed unanimously. An executive committee

was appointed to pursue this resolution. The committee chairman was Ira C. Davis, University of Wisconsin.

The National Committee's report recognized, however, that "funds for getting this new organization under way are not now available" and suggested that officers of the NEA solicit a fund from some educational foundation, adding that "the fund suggested is $5000 for one year. This fund would be used for payment of a secretary's salary in whole or in part, for some office expenses, for travel, for stationery and postage, and for stenographic help and incidental expenses." Supplementing the committee's report was a suggested constitution for the proposed National Council on Science Teaching, prepared and read into the record by Philip G. Johnson, Eastern Regional Vice-President of the Department since 1937 when he left the University of Nebraska to join the staff in science education at Cornell University. One year later, the Executive Committee chairman, Ira C. Davis, said in a progress report:

> During the past year, the Committee has held meetings at Chicago, St. Louis, and Milwaukee ... attendance of committee members and consultants has ranged from 40 to 75 ... the Committee is making all possible efforts to have teachers everywhere participate in the formation of this new program ... the final program will be theirs, not that of the Committee.

In a separate report on the Formation of a National Council, Davis had this to say:

> Soon after the meeting in Milwaukee last July (1940) a letter was sent to each member of the National Committee on Science Teaching, inviting him to become a member of the Committee on the Formation of a National Council. ...
>
> I have met with some members of this Committee several times this year. ...
>
> The committee members feel that a large majority of the Science-Teacher organizations are in favor of a National Council and are willing to assist in its organization. They are not all agreed on the type of organization which will best fulfill their needs. ...
>
> The Committee investigated the possibility of securing advertising for a proposed journal which the Council would publish, if organized. Letters were sent to publishers and to manufacturers of furniture and apparatus, and very favorable returns were received. ...
>
> After the Committee received a refusal of its request for funds from the Carnegie Foundation, a letter was sent to each member of the Committee to see if he would be willing to attend a meeting in Washington, D.C. at his own expense ... all but two members of the Committee said that they would attend such a meeting at their own expense.
>
> As Chairman I have not felt that such a meeting should be called this month. I still have hopes that we can find a way to secure funds to underwrite the expenses for a National Council for one year. ...

> The Committee hesitates to form a National Council without first getting some financial support. None of the members want to initiate a Council if they are not certain that it will succeed. If funds are secured, we can organize the Council within the next month or two. ...
>
> The field was canvassed for possible full-time secretaries for the National Council. Since we had no budget on which we might base a salary, we could go no further than discuss the qualifications of the persons considered. ...
>
> In conclusion, I will say that a National Council of Science Teachers could be formed now if the next year or two did not present so many uncertainties.[6]

Came July 1, 1942, and the NEA Department was again meeting in Denver, Colorado. At this meeting, a proposal that had been under consideration for more than a year to reorganize the Department as the American Council of Science Teachers (ACST) was affirmed for adoption; the new organization became official as of September 1, 1942. Philip G. Johnson was elected president for 1942-43. *The Science Teacher* was designated as the official magazine of the Council. This publication had been established in 1934 as a private enterprise of John C. Chiddix, a science teacher in Normal, Illinois. It was issued four times a year in format of 6½ × 9⅜ inches and usually 48 pages. Enough copies of each issue were purchased from Chiddix to service all members of the Council, the annual dues having been increased to $1 to make possible such expanded services.

Meanwhile, three subcommittees of the National Committee on Science Teaching submitted their reports. These were enthusiastically endorsed by appropriate reviewers, and another grant of $1,000 was provided by the NEA to get the reports into print. Thus the American Council of Science Teachers was able to launch its short-lived existence of two years with three notable contributions to the literature of science education: *The Education of the Science Teacher* (by the S. Ralph Powers subcommittee); *Redirecting Science Teaching in the Light of Personal-Social Needs* (by the W.C. Croxton subcommittee); and *Science Teaching for Better Living* (by the Nathan A. Neal subcommittee).

It was at this 1942 meeting that another important action occurred in the sequence of steps toward NSTA. Morris Meister, principal of the Bronx High School of Science and president of the American Science Teachers Association (ASTA),

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[6] "Report from the Committee on the Formation of a National Council," *1941 Proceedings*, Department of Science Instruction-NEA, pp. 108-109.

presented a request that "a plan of cooperation be worked out between that association and the American Council of Science Teachers." The minutes of the meeting report that "a motion was entertained and passed by unanimous ballot that the president of the American Council of Science Teachers meet with Dr. Meister and work out an acceptable plan." Negotiations proved successful beyond the suggested concept of cooperation. Two years later when NSTA was actually formed, these two organizations were the ones — the only ones among all that had discussed the idea of a National Council over a five-year period — to vote themselves out of existence by merging into the new organization.

It is now time to turn to a parallel sidetrack and have a look at the origins, purposes, and short life of the American Science Teachers Association. This can be done most simply and quickly by reading the following paper prepared in March 1938 by the ASTA President, Harry A. Carpenter, Specialist in Science, Rochester, New York, Public Schools.

The Development and Objectives of the American Science Teachers Association[7]

Harry A. Carpenter, President
Specialist in Science, Rochester Schools

For many years the committee of the American Association for the Advancement of Science on the Place of Science in Education has been interested to promote science education in many ways. This committee and other teachers throughout the country finally came to the conclusion that there might be a need for a national organization of science teachers that would be comparable in some respects to the National Council of English Teachers and National Council of Mathematics Teachers. In other words, they believed that some plan was desirable whereby the interests of science teachers on a country-wide basis might be consolidated. Therefore, the A.A.A.S. committee called a meeting of certain leaders in science education to be held in Boston in December, 1933, at the time of the meeting of the A.A.A.S.

More than one hundred teachers responded to this call, and a committee (with the writer as chairman) was appointed to investigate carefully the need for and functions of such a national association of science teachers.

It was realized that many science teachers already belonged to one or more teachers' organizations. Therefore, a new organization if formed must perform functions either not included in local organization objectives, or more suitably belonging to a more inclusive association or national organization. A new organization should not just duplicate functions of existing associations.

During the year following the Boston meeting, this investigating committee sent letters to the editors of 150 city, state, and national educational journals, with the request for the names of two or three of the leading

[7]Harry A. Carpenter, "The Development and Objectives of the American Science Teachers Association," March 1938, pp. 58-61.

science teachers in their community. Seventy-five replies were received from forty-three states, the District of Columbia, Alaska, and Hawaii. A second letter containing a tentative plan of organization and questionnaire was sent to 415 science teachers. These included not only the names of the teachers recommended by the journals, but also 72 science teachers who attended the Boston meeting, members of the National Association for Research in Science Teaching, and officers of 44 science teachers organizations throughout the country.

More than 150 replies were received from 104 cities and towns in 36 states, including the District of Columbia. Over 70% of the replies to the questionnaire favored the organization of a national association or federation of science teachers' clubs. Nearly 70% stated that they would identify themselves with such an organization if formed, and 74% stated they would advise other teachers to become associated with it and would advise their local city or state association to affiliate with the national organization.

In order to discover what might be the functions of a national organization, the questionnaire called for the listing of problems of local or national concern, the solution of which such an organization might aid. Eighty-three teachers submitted problems of such a character. On the basis of these problems, and other pertinent suggestions, the functions of a national organization were tentatively set up as follows:

1. Develop and promote a national policy of science education.
2. Foster professionalism among science teachers.
3. Promote publication and dissemination of research results and other material of interest and value to science teachers.
4. Promote adequate training of teachers in preparation and in service.
5. Promote interest in national acceptance of science objectives and teaching methods.
6. Encourage and promote research in science education under existing research organizations and educational institutions.
7. Promote and stimulate activity in local science teachers' organizations.
8. Determine and promote a 12-year science program.
9. Serve as a professional clearinghouse for local problems of national significance.

The type of organization proposed and sent with the original questionnaire was built somewhat on the model of the American Chemical Society, which plan had been adopted in New York State by the New York State Science Teachers Association, and later in Nebraska. This plan depends basically upon the local association. Each local association runs its business as local needs determine. The national association is under the control of a Board of Directors chosen by local associations from their own members. Money for financing the immediate needs of the national organization was to be furnished through the collection of directors' dues and individual memberships.

In December 1934 a second meeting of those interested in the organization of a national association of science teachers was held at Pittsburgh, Pennsylvania. This meeting was attended by 150 teachers, representing 69 cities and towns in 20 states, and the District of Columbia. Sixteen of the teachers attending the Pittsburgh meeting had also attended the Boston meeting.

The problems provided by the questionnaire results were made the basis of discussions at the Pittsburgh meeting as follows:

"Report of an Extended Inquiry Regarding a National Organization of Science Teachers."

"How Can Science Teachers Keep Up With Growing Science Knowledge?"
"Could a National Organization Develop and Promote a National Policy of Science Education?"
"Could a National Organization Stimulate Professionalism Among Science Teachers?"
"How Could an Organization Encourage, Promote, Correlate and Distribute Results of Research in Science Teaching?"
"Relation of a National Organization to Training of Teachers in Service?"
"How Could a National Organization Co-ordinate the Activities of Existing Science Associations?"

Discussion of these papers was encouraged. Consequently careful consideration was given to the need for and functions of a new national association of science teachers.

Following the discussion, which lasted more than one hour, those present voted "that a national association of science teachers shall be formed, and that tentatively its name shall be the American Science Teachers Association."

An organization committee consisting of the following teachers was elected:

Florence Billig, Wayne University, Detroit, Mich.
Wilhelm Segerblom, Phillips Exeter Academy, Exeter, N.H.
Homer LeSourd, Milton Academy, Milton, Mass.
W.L. Eikenberry, State Teachers College, Trenton, N.J.
John A. Hollinger, Pittsburgh Public Schools, Pittsburgh, Pa.
Otis W. Caldwell, Teachers College, Columbia University, New York City. (Now of the Boyce Thompson Institute, Yonkers, N.Y.)
Philip G. Johnson, University of Nebraska. (Now of Cornell University.)
Ralph K. Watkins, University of Missouri, Columbia, Mo.
Hanor A. Webb, Peabody College for Teachers, Nashville, Tenn.
Mary K. McBride, Supervisor of Science and Mathematics in the Junior High Schools, San Francisco, Cal.
Harry A. Carpenter, Rochester, N.Y. — Chairman.

This committee continued the study of the functions of such an organization, developed a proposed constitution and reported one year later — January 1936 — at St. Louis.

The meeting in St. Louis, Missouri, was attended by approximately two hundred science teachers, representing many cities, towns, and several states.

At the St. Louis meeting, the proposed constitution was presented by Dr. Philip G. Johnson, then of the University of Nebraska and now of Cornell University. After discussion, the proposed constitution was adopted with the provision that the organization committee would continue its study of the constitution, and submit it for approval at the meeting to be held in Atlantic City in December 1936.

In order to secure money for carrying on the business of the A.S.T.A., a resolution was adopted providing for an individual membership fee of $1.00, which fee was to be considered a charter membership fee until after the December 1936 meeting. The constitution further provided for directors' dues. A nominating committee consisting of Dr. Florence Billig, Dr. Hanor A. Webb, and Dr. Otis W. Caldwell made the following nominations for officers, which were approved and adopted:

President — Harry A. Carpenter, Rochester, N.Y.
1st Vice-President — Morris Meister, New York City

2nd Vice-President — Ada Weckel, Oak Park, Ill.
Secretary — Ellsworth S. Obourn, Clayton, Mo.
Treasurer — Homer LeSourd, Milton, Mass.
The Organization Committee was reelected.

At the Atlantic City meeting in December, 1936, Dr. Earl R. Glenn, Montclair State Teachers College, described "The Need for a National Publication for Science Teachers." The paper was discussed by Dr. C.J. Pieper, Editor of *Science Education*, and by Louis J. Mitchell, Chairman, Clearing-House Committee, New York State Science Teachers Association. As a result of this paper and discussions, it seems clear that one desirable function of the A.S.T.A. is to promote the development of a journal that will more adequately meet the needs of science classroom teachers all over the country, at whatever level they may be teaching. Whether this means the promotion of a present journal, or the development of a new journal of science teaching based on the consolidation of several existing journals, is still a problem. At any rate, an organization such as the A.S.T.A., with thousands of affiliated members all over the United States, should make it possible for a good magazine to receive sufficient circulation to warrant frequent publication at a low price. The journal problem is perhaps one of the most pressing immediate problems for the A.S.T.A. to solve, and it is certain that the more local associations affiliate with the A.S.T.A., the more likely the problem is to be solved through the work of their directors.

At the Atlantic City meeting, Dr. Johnson submitted a revised constitution. This was carefully examined by officers and members of the Organization Committee present, and further revised. It was then adopted. ...

One of the problems that had to be determined was the extent to which the A.S.T.A. would maintain a separate existence such as that of the National Council of English Teachers and the National Council of Mathematics Teachers, or whether it would seek to affiliate with the American Association of School Administrators or with the American Association for the Advancement of Science, many advantages appearing in both cases. The National Education Association is already served by its Department of Science Instruction, an organization some forty years old, but which had not functioned nationally until Dr. Ira C. Davis was appointed chairman in 1934 — one year later than the Boston meeting of the A.S.T.A. After careful consideration, the A.S.T.A. asked for affiliation with the A.A.A.S. on the grounds that our association with the leaders in science in the United States would strengthen not only the teaching progress in science as a special field, but would most certainly secure the cooperative interest of these scientists in science education. Therefore, at the Atlantic City meeting of the A.A.A.S., the American Science Teachers Association was accepted as "an associated organization of the A.A.A.S." This grant is a definite indication of the interest of the Executive Committee of the A.A.A.S. in the new organization, inasmuch as it is the first organization with such a youthful history to be admitted to membership in the A.A.A.S. ...

After the Atlantic City meeting, December 1936, the A.S.T.A. was ready to accept affiliation from local science teachers associations ...

The writer appreciates your attention to the reading of this chronology of the American Science Teachers Association. It has been presented in order that you may have all the facts, so far as they are available, on which to base your decision as to the desirability of your becoming an individual member, and urging your local science club to affiliate with the A.S.T.A.

When joining an organization, the question is always asked, "What shall we get out of it?" That question cannot be answered at present, although the answer is indicated in the objectives set forth in the constitu-

tion. Moreover, organizations will get out of a national association in proportion to what they put in. Perhaps today as never before there is need for science teachers all over the country to unite in order that science education may continue to receive the attention it merits from administrators and the public. Faculties in high schools are composed of an overwhelming proportion of teachers untrained and often uninterested in science. Just now there is a tremendous acclaim for social studies. In this day of science, shall we submit to the submergence of science as a most important and fundamental core subject in the general education of the child, or shall we unite to promote interest in science education on the part of the public and school administrators, and demand adequate science education for all children? We can each fight the battle in our own localities, but it seems to me that we must unite as to certain fundamental objectives and methods if we are to succeed in the long run. In spite of the tremendous influence of science in every phase of national life, in spite of the fact that practically every new thing in social progress depends basically upon science-trained men and the results of science, I find science in our schools is having a hard time to maintain its place.

Your science teachers' organization is invited and urged, therefore, to join with the other associations as an affiliated member of the A.S.T.A. Working together we shall give science the place it merits in the education of children.

March 25, 1938

The War Years

The war years, like the depression years before, presented obstacles to vigorous professional activity, not only of individual science teachers but of their organizations as well. Neither ASTA nor the Department/ACST flourished; in fact, not only were scheduled meetings cancelled but membership enrollments dropped sharply. Whereas it was claimed that the *1936 Proceedings* of the Department reached "over 4600 members," the 1942 report of the treasurer showed income from both membership and publication sales of only $646, which meant probably fewer than 1200 members (the annual dues fee had been increased to 50 cents in 1939).

But always there seems to be a 10 to 20 percent fraction of the profession who have the faith and also the zeal, energy, and good fortune of circumstances to work for improvement and advancement. So it was during the late 30s and early 40s with the idea of a strong, national organization for science teachers of all disciplines at all educational levels — "a voice for science teaching" and a fountainhead of information and services for the profession. Numerous leaders, disciples, and ambassadors have already been mentioned in this account.

Others whose names appeared among officers and key committee personnel during the pre-NSTA decade and who

later became officers and strong supporters of NSTA would include: Harold E. Wise, University of Nebraska (Department Treasurer 1936-37, NSTA President 1952-53); Greta Oppe, Ball High School, Galveston, Texas (Department Vice-President for Southern States 1939-44); Norman R.D. Jones, Biology Teacher, St. Louis, Missouri (Department Vice-President for North Central States 1941-42, ACST President 1943-44, NSTA President 1948-49); Hugh C. Muldoon, Duquesne University (leader of Duquesne University Conference for Science Teachers in Catholic High Schools, NSTA Treasurer 1944-45); Hanor A. Webb, George Peabody College for Teachers, Nashville, Tennessee (active in the National Association for Research in Science Teaching, member of organizing committee of ASTA, NSTA Secretary 1946-52). There were a few others, however, who dropped out of active involvement in the movement, once it was well underway. An outstanding example in my view was Ira C. Davis who, as we have seen, was a prime mover in the drive that led to NSTA. Except for service on the Board of Directors 1948-52, he seemed content to be "just one of the members" but was always strongly supportive.

The years 1942-44 were the final gestation period for NSTA. Consultation and planning by Morris Meister (of ASTA) and Philip G. Johnson (of ACST) went on apace, although, of course, others, too, were involved in discussions and the exchange of ideas. Especially helpful in generating NEA support were Norman R.D. Jones and Reuben T. Shaw, Supervisor of Science for the Philadelphia schools and a Past President of NEA. At this point in the story we pick up an account of the situation, the culminating activities, and finally the formation of NSTA, as reported by Johnson in the *1944 Yearbook* of NSTA (a new-born, not-sure-it-will-live organization).

The National Science Teachers Association
A Brief History of Developments[8]
Philip G. Johnson
Cornell University, Ithaca, New York

I. The Need:

Several subject matter groups have had full time executive secretaries and national headquarters with facilities for the promotion of their subjects in the schools. This has not been true for the sciences. As a result, no one person has been both a spokesman for the science teachers and at the same time available for extensive consultation by national and sectional groups who have made plans for the modification of school curricula.

[8]*1944 Yearbook*, NSTA, pp. 2-6.

Furthermore, no person has devoted full time to the watching of educational trends as these may have had influence on the sciences and then called on other persons to participate in those projects which might have influenced these trends in favor of the sciences. In addition, there has been no organization for quickly reaching the science teachers of the nation and no plan for the active cooperation of all science teachers in work related to the advancement of the sciences in the schools. There has been no group with influence sufficient to win the generous support of science teachers, Foundations, or other agencies. Science teachers have been divided and therefore ill fitted to meet the needs of the times.

Substantial work has been done in discovering young scientists but organizations of science teachers have been only remotely connected with this project. The various broadcasting companies have arranged science program series for use in schools and for the education of laymen but organizations of science teachers have played little or no part in these plans. Science clubs have been enrolled and stimulated to work but organizations of science teachers have done little to encourage these projects. Federal agencies have prepared and distributed materials related to the sciences but organizations of science teachers have seldom been consulted during the planning and less often asked to assist in getting the materials to the teachers. Commercial organizations have planned and prepared a multitude of pamphlets, charts, exhibits, and other materials but groups of science teachers have had little or no opportunity to share in the planning or in the distribution. National, sectional, state and city committees of educators have arranged curricula, programs of studies, schedules, required units, examinations, and other materials which have had profound influences on science teaching but science teacher groups have had a very meager part in the planning of these materials. State departments have set up requirements for the issuing of licenses for science teachers but organizations of science teachers have exerted little influence in the defining of these requirements, only recently have organizations of science teachers taken a hand in promoting of desirable standards. Science teachers have had no voice in the establishment of many of the conditions which have weakened the teaching of science. They have been divided and easily conquered. These conditions should not have existed for so long a time.

II. Efforts of the Past:

(a) In the middle twenties the Coordinating Council on Nature Activities received a grant of $18,000 from a Foundation for a 3-year project related to the advancement of nature study and science for young people. About 30 organizations of scientists and science teachers were involved in this project. The funds were expended without achieving a permanent plan for the maintenance of the services as conceived.

(b) The committee on the Place of Science in Education of the American Association for the Advancement of Science began a study of the needs of science teachers as compared to the services available to teachers in other subject matter fields. Their studies began in the early thirties and a group of science education leaders was asked to meet in Boston at the 1933 meeting of the A.A.A.S. for the purpose of hearing the reports and deciding what should be done. At this meeting a committee was appointed to investigate further the needs for one strong national association of science teachers. At the 1934 meeting in Pittsburgh a committee was selected to make plans for an organization. A year later a proposed constitution was presented and adopted. Officers were elected and further studies of the constitution were recommended. A revised constitution was presented and adopted at the Atlantic City meeting in 1936 and organizations of

science teachers were invited to affiliate with The American Science Teachers Association. Since that time this organization has planned and presented a number of excellent programs. Prominent scientists have participated generously in these programs and the teachers who attended the meetings were challenged by the addresses and the many evidences of good will. During the war period this organization has held no meetings. At the Dallas meeting in 1942, the members voted to use *The Science Teacher* as the official magazine.

(c) The Department of Science Instruction of the National Education Association was organized at the Denver meeting in 1895. Prominent scientists and other persons interested in the improvement of high school science instruction participated in the organization. Since that time this group has carried on with varying degrees of influence and activity but there has been a tendency for the scientists to withdraw their interest and support. This has left the Department under the influence of classroom science teachers, science supervisors, and some other leaders in science education. In 1934 the Department experienced a vigorous rebirth and soon there were several thousand members. Challenging meetings were held and the papers presented at the annual meeting were delivered to all members in the form of a yearbook. For 1936 and for the next several years, the Department won annual grants-in-aid in order to carry forward for the sciences what the Educational Policies Commission had recommended. In 1940 at the Milwaukee meeting, the central committee of these national committees which had been working on the projects proposed to the Department that there should be a reorganization of the Department in order to bring one strong national organization of science teachers into existence. The details of the proposal are given in the yearbook for 1940. The officers and directors of the Department were reluctant to give approval to general plans and therefore they presented a suggested constitution to reveal what was involved. This constitution was given approval in principle and delivered to the central committee for further studies. The central committee made approaches to an educational foundation for funds. General plans were presented to several groups of science teachers for approval. Efforts to secure funds failed and the plans came to a virtual standstill.

The officers and directors of the Department were unwilling to let this project die and desired to cooperate in a reorganization. Reports at the 1941 meeting in Boston revealed no further activities of the central national committee and the officers with the directors decided to continue the planning for a national council of science teachers. A revision of the proposed constitution was mailed to officers, directors, and about 50 other leaders in the early months of 1942. Many changes were incorporated and a revised constitution together with a ballot for voting was distributed in March, 1942. The ballots as returned were unanimously favorable and the Department became The American Council of Science Teachers at the meeting in June, 1942. The constitution as approved was printed in the yearbook for 1942 and *The Science Teacher* was named the official magazine. ...

(d) In April, 1943, the president of the American Council of Science Teachers was invited to represent science teachers in a national committee which had been selected to study the needs for instructional guides for teachers of health. At this time cooperative relations were established with the Civilian Pre-Induction Training Branch of the War Department and the United States Office of Education. This led to additional committee work in May. In June, 1943, several biological science teachers from various organizations of science teachers were invited to give a week to the planning of a health bulletin for teachers. During this week the out-

line for the bulletin was prepared and several sections were drafted. The problem of getting materials to teachers in the schools throughout the nation was constantly before these science leaders. The failure to find in any existing organization the resources for printing and distributing even a brief statement of suggestions was very disconcerting and resulted in the preparation of a statement of needs with some possible steps for the improvement of the situation. This statement of needs and proposals was approved by these representatives and a person was elected to promote the changes needed to unify the groups of science teachers into some effective national plan.

A group of physical science teachers representing various organizations of science teachers was brought to Washington in July, 1943 for the preparation of special suggestions related to the physical sciences. They felt that several suggestions should be sent to science teachers and school administrators throughout the nation. They too were annoyed to find only limited resources for the printing and distribution of suggestions. This condition caused them to study and approve the statement of needs and general proposals as prepared by the representatives of biology teachers. They appointed the same person to assist them in bringing about a solution to this situation.

The statement of needs and a plan for unified action was published in four leading journals with wide circulation among science teachers. Favorable reaction and not a few questions were received from many leaders among the workers in the sciences. A detailed statement of proposals was circulated among members of the committees and many other leaders during September and October of 1943. Criticisms were studied and a revised statement was distributed during November. Two major groups of science teachers (ASTA and ACST) held meetings during that month and the proposals were given approval in principle. Each group appointed a person to represent them in the time between annual meetings. Within a short time these and other representatives began to ask for a meeting in order that no further delays be experienced in solving the dilemma of science teachers.

III. The Situation in April 1944:

There were two general national organizations of science teachers each enrolling members and inviting affiliations: The American Science Teachers Association, an affiliate of the American Association for the Advancement of Science, and The American Council of Science Teachers, a Department of the National Education Association. There was one other national general group that had published a journal but maintained no formal plan for affiliations of more local groups: The Duquesne University Conference for Teachers of Science in Catholic High Schools.

There were two general sectional organizations of science teachers: The Central Association of Science and Mathematics Teachers and The Association of Science Teachers of the Middle States.

There were several restricted national organizations of science teachers, such as: The National Association of Biology Teachers, The American Nature Study Society, The Division of Chemical Education of the American Chemical Society, The American Association of Physics Teachers, The National Council of Geography Teachers, The National Council on Elementary Science, and the National Association for Research in Science Teaching.

There were several sectional organizations with rather extensive influence but restricted to one subject matter area in the sciences such as The New England Association of Chemistry Teachers. ...

There were several general metropolitan organizations of science teachers, such as The Federation of Science Teacher Associations of New York City and The Chicago Round Table. There were also many restricted metropolitan organizations of science teachers, such as The Greater Cleveland Association of Biology Teachers and The Detroit Biology Club. There were many such organizations over the nation and a generous number of them were affiliated with some national organization of science teachers.

There were a number of state groups of the general type, such as The Nebraska Science Teachers Association, The New York State Science Teachers Association, and a group recently organized in California. There were also several restricted state science groups, such as The Illinois Association of Chemistry Teachers.

Finally, there were many regional, county, and city groups of science teachers. Many of these groups were very informal and maintained no affiliations but some of them were affiliated with state, sectional, and in some cases national groups.

THERE WAS NO ONE GROUP WHICH RELATED ALL OF THESE GROUPS INTO ONE COMPREHENSIVE PLAN.

As a corollary to this situation, there were a number of journals for science teachers. Some of these had a substantial record of service while others had experienced temporary suspensions and increases in rates. Only a minority of the science teachers in the United States were reached through these publications and no central office was available to serve these publications.

Finally, most of the science teachers organizations were struggling with rather limited resources. Deficits and increases in dues were not uncommon. The publication of special bulletins and reports had been a rare occurrence and the volumes were limited in size as well as in helpfulness. In comparison to several other subject matter groups, science teachers were not using their resources very effectively and they were not able to win for the science studies the support which was warranted in terms of the current importance of science as well as the potential services which the sciences might perform for the growth and advancement of the nation.

IV. Results at Pittsburgh in April 1944:

One or more representatives from twelve organizations of science teachers participated in the plans for achieving national unity of science teachers. There were strong sentiments expressed *against* the planning for any additional organization since it was felt that there were too many organized groups now on the scene. Furthermore, the representatives felt that organized groups now rendering a constructive service should remain relatively free to continue and, if desired, augment such services. As a corollary, it was felt that no new journal for science teachers should be planned. However, there was a deep feeling of need for a single strong national group in which all groups could work cooperatively without even a suspicion of domination by either groups or individuals. Furthermore, this single strong national group should have direct relationships with scientific, professional, and industrial organizations and there should be an adequately supported and staffed national headquarters serving all science teachers both directly and through the cooperation of some science teacher organizations.

The solution which was proposed and approved called for a merger of The American Council of Science Teachers and The American Science Teachers Association and the affiliation of all major groups of science teachers with the group resulting from the merger. A constitution based

on this proposal was prepared and adopted with the provision that should the merger fail to take place by the close of 1944 the proposed National Science Teachers Association would be disbanded. ...

V. Accomplishments April to September:

The officers and directors of both The American Council of Science Teachers and The American Science Teachers Association have voted approval of the merger proposals. The National Education Association has accepted the National Science Teachers Association as a Department. The American Association for the Advancement of Science has given assurance that the new group will be given sympathetic consideration when organizational details have been completed and an application for affiliation is in order. ...

Plans have been made for a Board of Directors meeting to be held in Cleveland on Sept. 15 and 16. ...

Memberships materials have been planned so that final revision and printing can follow the reconstitution of the Board of Directors and the election of officers. *The Science Teacher* has been selected as the journal for 1944-45 and plans for a 1944 yearbook have been completed. ...

It is to be expected that a vigorous campaign for members will be launched early in the fall, committees will be appointed and their responsibilities will be defined, and a national effort for better and more science teaching will get under way. The future will reveal how well this planning can serve the needs of youths and adults through the sciences.

Interestingly, the initial plan of having all directors attached to and representing other science teaching groups was soon abandoned. There were, I suspect, two principal reasons for this. First was the to-be-expected growth of feeling among NSTA members that officers and the Board of Directors of *our Association* should be chosen from the ranks of our *members* and not because of wearing the hats of other groups. Second was the undoubtedly difficult task that a director of another society faced when, as a member of the NSTA Board, it became necessary to vote on ideas, proposals, or courses of action that threatened to curtail, or diminish, or "take over," or make inroads as regards the group being represented. In any event, only the School Garden Education Section stayed with NSTA, officially merging in September 1945. All other groups drifted away to continue their own independent courses of action, thus leaving NSTA to "go thou and do likewise."

The chapter concludes on what may now seem to be a low-key note. All that need be said is that following the Cleveland meeting of the proposed Board of Directors on September 15, 1944 (which was only partially attended), changes were made in the Constitution and Bylaws, and the revised document, together with a ballot, was sent to all officers and directors for a vote by mail. By early October the necessary number of affirmative votes was received, and the officers and directors

were duly notified of their confirmation. Thus the conditions established at the July 4 meeting in Pittsburgh were met; NSTA was in business.

Through all the succeeding years, the Association enterprise has been spearheaded by a succession of Presidents (Appendix II) and Boards of Directors (Appendix III) who have held firm to the basic reasons and goals for establishing NSTA. They have served unselfishly with devotion, good judgment, and courage, thus developing the fledgling organization into the viable Association that it is today. The first set of officers and directors for 1944-45 deserves special attention. Individuals who were especially active in the drive to establish an NSTA were entrusted (or shall we say rewarded?) with the responsibilities of officers to get the new organization off the ground and flying. The roster of directors was comprised of representatives of other science teaching societies that had been consulted, involved, and invited to join, affiliate, or at least cooperate in the effort. The makeup of that founding Board of Directors was as follows:

President
Philip G. Johnson, Cornell University, Ithaca, New York
General Vice-Presidents
Morris Meister, Bronx High School of Science, New York, New York
Norman R.D. Jones, Southwest High School, St. Louis, Missouri
Regional Vice-Presidents
(Western) W. Bayard Buckham, Oakland (California) High School
(North Central) Fred W. Moore, Senior High School, Owosso, Michigan
(Southern) Greta Oppe, Ball High School, Galveston, Texas
(Eastern) Ethel Ramsden, State Teachers College, Montclair, New Jersey
Recording Secretary
Deborah Russell, State Teachers College, Framingham, Massachusetts
Corresponding Secretary
Nathan A. Neal, Cleveland (Ohio) Public Schools
Treasurer
Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania

Directors

Maurice U. Ames, Board of Education, New York, New York (representing the Federation of Science Teacher Associations of New York City)

Florence Billig, Wayne University, Detroit, Michigan (representing the National Association for Research in Science Teaching)

John C. Hogg, Phillips Academy, Exeter, New Hampshire (representing the New England Association of Chemistry Teachers)

Emil L. Massey, Board of Education, Detroit, Michigan (representing the Central Association of Science and Mathematics Teachers)

W.H. Michner, Purdue University, West Lafayette, Indiana (representing the American Association of Physics Teachers)

Laurence L. Quill, Michigan State College, East Lansing, Michigan (representing the Division of Chemical Education, American Chemical Society)

Merl A. Russell, Biology Teacher, Royal Oak, Michigan (representing the National Association of Biology Teachers)

Reuben T. Shaw, Northeast High School, Philadelphia, Pennsylvania (representing the Association of Science Teachers of the Middle States and Maryland)

Dwight E. Sollberger, State Teachers College, Indiana, Pennsylvania (representing the American Nature Study Society)

Paul R. Young, Board of Education, Cleveland, Ohio (representing the School Garden Education Section of NEA)

2

Administration, Housing, and Finance

Hiring an Executive Secretary

"Have organization, must travel." That was the plight of NSTA for four years following its founding in 1944. As Morris Meister put it, "Wherever the president wears or hangs his hat, that's where the NSTA office is." Phil Johnson (1944-46) and Meister (1946-48) endured this situation, but simultaneously carried on negotiations with top staff officers of NEA that resulted in setting up a Membership-Packet Service office at NEA in 1947 and a full-fledged headquarters office there in September 1948 during the administration of Norman R.D. Jones.

From the outset of thinking about an NSTA, the planners held to three primary goals apart from projected professional activities. They were: a headquarters office in Washington, D.C.; a full-time executive secretary; an association-owned journal. Thus, with setting up an office at NEA in 1947, installing an Executive Secretary in 1948, and negotiating the purchase of *The Science Teacher* by 1950, all three of these goals were achieved in a span of six years following the birth of the organization.

The employment of a full-time executive secretary was the greatest stride forward in the early history of the fledgling organization. (I say this factually and apart from my personal involvement.) By about July 4, 1948, negotiations with NEA Executive Secretary Willard E. Givens and Business Manager Harold Allen produced an agreement to provide NSTA with rent-free headquarters space in the NEA building at 1201 Sixteenth Street, N.W., in Washington, D.C., and provide certain business services to NSTA free of charge. Also the NEA agreed to provide grants-in-aid for three years in the amounts of $8500, $8000, and $7500 per year to enable headquarters operations to begin. With this assurance of support, the NSTA Executive Committee began its search for an Executive Secretary and made plans to establish a full-fledged Washington office.

I had been a member of the prior Department of Science Instruction and joined NSTA in 1944 along with 1500 or so other charter members. I attended a few meetings of the new association and even "spoke up" at one or two. Thus it was, I suppose, that I came to the attention of presidents Phil Johnson and Morris Meister; how else I do not know, because I had met both of them only "in passing," so to speak, prior to 1948. During 1944-48 I had, however, served on the NSTA committees on resolutions, nominations (two years), affiliated groups, and publications. I was elected and served as Eastern Regional Vice-President during 1945-46 and was elected to the Board of Directors for a one-year term 1948-49. In these roles with NSTA, I was not involved in the development of plans for the Association as evolved by the Executive Committee. Early in the summer of 1948, as a member of the Board (but not of the Executive Committee) and along with all others, I received a letter or memo from President Jones informing us that the NEA had agreed to support and subsidize NSTA in setting up a headquarters office and inviting nominations of persons for consideration for the post of Executive Secretary. I still have a copy of my letter of reply to Jones, in which I suggested only one name (not my own).

It was a shocking surprise that awaited me one Sunday afternoon in mid-August 1948 when I returned home from a fishing weekend in upper Michigan. I was to call Norman Jones as soon as possible. I did. He went straight to the point — said that the Executive Committee had authorized him to invite me to become the first Executive Secretary of NSTA and that they wanted my answer within 48 hours. That bombshell certainly caused some hasty, serious deliberations! Only one year earlier I had sold a house in New Jersey, given up my job at Newark College of Engineering, taken a $400 salary cut (from $4200), and paid my own moving expenses in order to join the staff in physical science in the Basic College at Michigan State University. Oh, yes; I also "cashed in" 19 years credit in the retirement system of the State of New Jersey. To accept the bid from NSTA meant giving up what had proved to be the most satisfying teaching job I ever had, selling a house all over again and buying another one in Washington, paying all moving expenses once more (employers seldom paid or even shared such costs in those days), and going into a tenuous job situation that might last only a year or so — depending. Moreover, it was now less than a month before the opening of the Fall quarter

and I was under contract. On the plus side, the NSTA Executive Secretary was to be paid $6500 per year! (The executive committee, I later learned, had proposed $6,000, but NEA officials urged $6500 because of the high cost of living in the Washington area.)

Deliberations completed and release from contract without prejudice assured, I accepted the offer. At a meeting on September 4, 1948 in Morris Meister's home in New York City, and in the presence of the full Executive Committee, my hiring was officially consummated; I was on the payroll; my job description was then spelled out for the first time — and my feet chilled a bit. Perhaps you can see why by reading the following letter of understanding covering my appointment; it was composed by Hanor A. Webb (the Sam Ervin of science education) but, of course, was signed by Norman R.D. Jones as President.

> At a meeting of the Executive Committee, National Science Teachers Association, held in New York City on September 4, 1948, your duties as Executive Secretary of the Association were discussed. It was decided to offer you this memorandum of our mutual understanding in respect to these duties:
>
> 1. *Appointment and title.* This letter formally confirms your appointment to the post of Executive Secretary of the National Science Teachers Association. Miss Bertha Elizabeth Slye is to be your associate in the NSTA office with the title of Director of Membership Service.
>
> 2. *Term of office.* No formal contract of your employment will be executed, but the Executive Committee favors a three-year term unless conditions make it mutually advisable that the service be terminated.
>
> 3. *Salary.* Your salary will be at the rate of $6,500 per annum, starting with September 1, 1948. It will be paid in accordance with the practices of the National Education Association.
>
> 4. *Retirement provisions.* As soon as you are eligible under the personnel practices of the National Education Association, an annuity arrangement in the standard form will be made, with a deduction of 5% from your salary and a matching of 5% in addition to your salary, to make annuity remittances of 10% according to the N.E.A.'s plan.
>
> 5. *Vacations, etc.* Provisions for vacation, leave, and similar matters shall be according to the bulletin, "Personnel Regulations for the staff of the National Education Association."
>
> 6. *Travel.* Travel on NSTA business should be a matter of mutual agreement between you and the president of NSTA, except for emergencies. The mechanics of travel reimbursement shall be those of the N.E.A. Plans for travel should be worked out as far ahead as possible.
>
> 7. *Office duties.* You are to be in charge of the office of the National Science Teachers Association. You are responsible for its correspondence, its records, and its services. You may delegate the details of the office activities to such competent associates and secretarial aides as may be provided.
>
> 8. *Office records.* You should develop systematic records in your office with particular attention to the following:
>
> (a) *Membership records.* These should be kept in current condition, with systematic methods of securing renewals, providing correct mailing

lists to *The Science Teacher* and the Packet Service, and reporting accurately the number and distribution of members.

(b) *Finance records.* You should keep an account of all financial transactions, and check your records periodically with the Treasurer of NSTA and the Accounting Division of the N.E.A.

(c) *Documents.* You should work out a plan for the safe and convenient filing of the official documents of the NSTA, allowing for an annual increment. Reference to such files should be convenient.

(d) *Historical documents.* At your early convenience you should make provisions for the storage and preservation of the early documents of the NSTA and of its predecessors, the Department of Science Instruction of the National Education Association, and the American Science Teachers Association affiliated with the American Association for the Advancement of Science. You should add important records to this file each year.

(e) *Publications.* You should obtain bound volumes of *The Science Teacher* with as complete a file as possible. All other publications of the NSTA — yearbooks, bulletins, reports, etc. — should also be on file either bound or suitably protected.

(f) *Minutes.* One bound and one reference file of the minutes of NSTA meetings should be kept.

(g) *Library.* At such time as may be practicable a reference library of science teaching material should be started, and enlarged to such extent as may seem appropriate.

(h) *Packets and packet material.* At least one — preferably several — copies of each item submitted for evaluation should be kept in some convenient file. A few sets of each Packet should be put in substantial envelopes and kept for reference.

9. *Promotion.* Your highest responsibilities concern the promotion of the services of the NSTA, chiefly through memberships. You should put your best thought on promotion material, circulars, brochures, blanks, and all forms of membership solicitation by printed matter. All official printing of the Association is to be cleared through you, and careful attention to the text and appearance of this material is urged upon you. Other aspects of promotion, such as arrangements for distribution of membership blanks at meetings, etc., are matters for your planning and execution.

10. *Publicity.* Official publicity concerning NSTA should come from your office, either over your own name, or over the name of some officer or committee member. The following aspects of publicity seem of importance:

(a) *News releases.* Working in cooperation with the publicity bureau of the N.E.A., prepare and distribute news items concerning NSTA activities, meetings, elections, resolutions, and similar matters worthy of notice in selected newspapers and periodicals.

(b) *Program mailings.* Plan for the printing and distribution of programs of meetings, mailing to members and others whose interest should be aroused.

(c) *Publicity in The Science Teacher.* Plan for NSTA items in each issue of *The Science Teacher*, prepared by officers, members, or by yourself.

11. *Cooperation with Committees of NSTA.* You are ex-officio member of every committee of the NSTA. While the duties and responsibilities of the chairmen and members of these committees are no less than heretofore, you should keep yourself informed of the committees' activities, serve as a coordinator and counselor, and if necessary a stimulator, of their plans.

12. *Relations with Affiliates.* The relations of NSTA with its affiliates should be improved. The list of affiliated groups of science teachers should be increased by careful planning for practical association with

their officers, publicity to their members, and other methods of obtaining true affiliation.

13. *Relations with the National Education Association.* Fully recognizing the encouragement and aid the National Education Association has given to NSTA in quarters, facilities, counsel, and funds, we recommend that your relations with the officers of the N.E.A. shall be kept on the highest plane of cordiality, and that the advice of these officers be sought on all matters in which their experience gives them understanding.

14. *Relations with the American Association for the Advancement of Science.* Inasmuch as NSTA is an affiliate of the A.A.A.S., which has headquarters in Washington, we recommend that you establish a close acquaintance with the officers of the A.A.A.S., become familiar with their policies, and seek their advice on matters in which their experience gives them understanding.

15. *Relations with the U.S. Office of Education.* Since the U.S. Government's chief agency for the services to teachers is located in Washington, we recommend that you become personally acquainted with the staff of the U.S. Office of Education in the fields of science at all levels, of related fields such as industrial arts and home economics, geography, school planning, etc., and with the specialists in elementary and secondary education, curriculum, and related educational activities.

16. *Relations with other scientific organizations.* We suggest that you acquire as wide an acquaintance as possible with the officers and executives of those scientific organizations that have headquarters in or near Washington, and with those Government agencies and bureaus that carry on scientific research or administer scientific programs. These contacts may be of great value in the future.

17. *Consulting service.* The NSTA has officially adopted a consulting service for educational materials, concerning which many questions of procedure have arisen. We recommend your consideration of the possibilities and opportunities of such a service, with the view to recommendations, in due time, as to policies of practical nature.

The Executive Committee and the Directors of the National Science Teachers Association are genuinely pleased that you have been available for this post of Executive Secretary, and assure you of full cooperation in the interests of the Association. We will welcome your vigorous action and prompt decisions in conducting the business of the Association, and frankly prefer that you make some mistakes than that your experience should come too slowly. We expect you to follow your own best judgement after weighing our counsel, and assure you of our confidence in your earnestness, and our appreciation of your considerable experience.

By the time this letter reached me, I was in Washington getting the office organized and, in the midst of a housing shortage, looking for a place to live (a search that took eight weeks). My reply to Jones was as follows:

The memorandum is an excellent summary of the points which we discussed at our meeting in New York City on September 4, 1948. I am pleased to accept this as my "guide to action" in the office of Executive Secretary I have no questions, objections, or mental reservations concerning any of the main points or subpoints in this memorandum. I think we all understand that the real basis for a mutually satisfying relationship is stated in part of the first sentence of the last paragraph: "full cooperation in the interests of the Association." I think we all agree, too, that the interests of the Association are best served when we serve the needs and

> interests of the individual members of NSTA, particularly the teachers in the classrooms at the "grass root" level.
>
> I expect to do my level best in this position. I have long had a real interest and an active part in NSTA affairs. My training and chief experiences have been as a classroom teacher of science. You can be assured that I would not have left my position at Michigan State College had I not been convinced that I could be of more service to science education in this post than there, and that I would be equally happy in serving as your Executive Secretary.

I have often thought that it was good (for me) that the time allowed for my decision was so short and that the job description was not fully revealed until after I had accepted. If I had had two weeks instead of two days to think it over, and if I had known the details of what was expected, I might have declined.

When my successor, Robert L. Silber, was selected during 1972-73, a Search Committee appointed by President Elaine W. Ledbetter spent the best part of a year conducting its search. The vacancy was widely announced and volunteer applications were received — about 40, I was told (I was not part of the committee and was not involved except on occasion to supply requested information, but never opinions or evaluations). The committee met two or three times to review data submitted by the applicants and finally narrowed the field to three finalists who were brought in for personal interviews lasting two to four hours each. The Search Committee made its recommendation to the Executive Committee which, having approved the recommendation, in turn passed the recommendation on to the full Board of Directors. As required by the NSTA Bylaws, the Board in accepting the recommendation completed the appointment of Bob Silber as the second Executive Director of NSTA (including the change in title from Executive Secretary). He joined the headquarters staff June 1, 1973 and took over in full charge August 1, 1973, at which time I went on administrative leave until official retirement February 1, 1974.

Housing

The NEA Headquarters in Washington, D.C. was the home of NSTA's headquarters office until late July 1974. At first (1948) we were allocated about 600 square feet, and this served our staff of four very well for about two years. Our furnishings were sparse; we shared two telephones; but we managed. In fact, we grew soon to a staff of six, and the NEA recognized or

yielded to our growth by enlarging our space to about 800 square feet. Here we lived until the summer of 1951, meanwhile increasing to eight in number (and it was a bit crowded!). By then, the NEA had decided on an extensive, phase-by-phase program to enlarge and modernize its 1201 Sixteenth St. center. Phase I consisted of razing to its steel skeleton the building in which NSTA was housed; consequently, we had to move. We moved into four rooms with three baths in the Martinique Hotel. This was an adjoining property on Sixteenth Street which the NEA bought, to be demolished and replaced by Phase III of its building program. The NSTA suite was a beauty — located on ground level at the back of the building, looking out on a closed-court alleyway, right above the trash collection station, and with the hotel's kitchen exhaust fan directly beneath one of our windows. A five-minute visit by officers, directors, or members was enough to allay any possible fears that NSTA was squandering money on plush headquarters.

With the completion of Phase I of the NEA building program, NSTA moved back into the NEA Center. Here is how this event was reported to our membership.

Moving Day at NSTA

February 26, 1956 is a date to be remembered. On that day, NSTA forsook its "four rooms and three baths" in the Martinique Hotel and moved into 1,000 square feet of modern office space in the new, air-conditioned NEA Educational Center. Our unending thanks go to the thousands of teachers whose NEA Life Memberships, contributions, and pledges have made possible this beautiful, functional headquarters for nearly 600 staff members of the NEA and its departments, divisions, committees, and commissions.

There are many values associated with NSTA's departmental status in NEA: easy and effective communication with all segments and levels of the educational profession; a location in Washington along with dozens of other scientific and educational groups; and the provision of rent-free space and office facilities. The latter, plus utilities and related services, would cost NSTA at least $7500 a year, or more than one dollar per individual member, if we were not part of the NEA.

You can show your appreciation and give support for the continuation of this assistance by being a member of NEA. Better still, make it a Life Membership; and then give to the building fund as your interest and circumstances permit. If you want to do these things through NSTA, your staff will be glad to help you.[1]

The provision by NEA of rent-free space and certain services to all of its independent Departments (NSTA included) continued to be the policy until 1967. The services included, as desired, such items as handling the payroll, tax withholdings,

[1]*The Science Teacher*, March 1956, p. 103.

and Social Security payments; purchasing of supplies and equipment; handling income monies and paying (on order) all bills; maintenance of membership records; shipping and billing for publications sales orders; duplicating of materials; and so on to assistance from the NEA Divisions of Publications and Research. Some services were provided without charge to the Department while others were available at low cost. By the mid-60s these practices and related items came under severe attack. There had developed within the NEA membership a highly vocal and, ultimately an extremely influential group or "wing." In time, this movement gained the upper hand and drastically changed the character and activities of the entire National Education Association. Details of this are not part of the NSTA story, but the impact of the movement and the tactics of the leaders were inescapable. The attack on Departments characterized us as "free-loaders" (for apparent reasons), "subversives" for occasional disagreement with NEA policies, resolutions, or positions, and "traitors" for not enforcing a requirement that all our members become members of NEA. Before very long, another central goal of the movement became crystal clear: "spin off the administrators and supervisors" and thus make the NEA truly an organization of classroom teachers (precollege, of course).

As might be expected, departmental reaction to the NEA action soon set in. The executive secretaries of nearly all the Departments joined forces and named what I called "the defense committee." I was chosen to be its chairman. We met, discussed, met with NEA staff, developed proposals and counterproposals, and, in due course, met with a special group appointed by the NEA. From the deliberations of this joint task force there emerged a plan which I was commissioned to present to the NEA Board of Directors, which I did, and which was adopted by NEA. The plan included a non-controversial, complete solution to the "free-loaders" charge — we in the Departments agreed without argument that we should pay rent for space occupied and should pay for services utilized. Within a year, this shift in practice added approximately $25,000 per year to the NSTA expense budget. The other main component of the newly adopted plan was a three-pronged route for affiliation with the NEA: first was status as a Department for three or four groups that were 100 percent financed (and thus largely controlled) by NEA, even though they had their own elected

officers and went through the motions of being independent organizations; second was provision for enrollment as a National Affiliate of NEA, entailing certain agreements and restrictions but giving about a 30 percent discount on the rental charge for space; and third was the category of Associated Organization, which involved no obligations, restrictions, or abridgment of independence and set the space rental cost to the Associated Organization at essentially the commercial going rate.

Hopes were high that this plan would salvage and preserve "the NEA family" at 1201 Sixteenth St., N.W. Such was not to be. The handwriting was soon again on the wall — the NEA drive for unified membership among local and state organizations and the national association was to be pushed relentlessly, and the ominous threat was clear that NEA-related groups like NSTA had better shape up and go along or else prepare for excommunication. A few groups packed up and moved out to other quarters rather promptly, among them the Association for Higher Education, the Association of Colleges for Teacher Education, and the Council for Exceptional Children. As for NSTA, a 1968 poll of the membership on aspects of relations with NEA produced the heaviest voting response ever (over 80 percent) and clearly revealed that eight out of nine of our members wanted a firm, no-yield stand against any move by NEA to impose a mandatory membership requirement. In fact, nearly 50 percent of the members indicated that they would resign if such a regulation were accepted by NSTA and enforcement measures were attempted. The conclusion was stark and clear: The officers of NSTA should find some place to land in case we had to jump.

At the July 1968 annual business meeting of the Board of Directors, two actions were taken relative to NEA relations and headquarters space. First, the Board voted to change our status with NEA to that of Associated Organization, the nearest thing to but still short of a complete divorce. Second, the Board adopted the recommendation of outgoing President Morris H. Shamos to launch a Capital Fund Campaign (CFC) and seek to raise funds necessary to meet the costs of relocating in our own headquarters space somewhere other than at NEA. Incoming President Elizabeth A. Simendinger immediately appointed Shamos chairman of a CFC Committee and urged the Committee to begin work immediately.

One year later (July 1969), the CFC Committee reported that it had considered several alternatives for relocating the office and had weighed the pros and cons of each. Foremost among the options considered were: simply renting space in a commercial building in Washington; moving away from Washington, say, to Boulder, Colorado, and renting space from a university or a commercial firm; buying an existing building in Washington; putting up our own new headquarters building; or finally, moving to a suburban area 15 to 30 miles outside Washington; for example, several associations planning to leave the NEA were already involved in buying adjoining three- to five-acre parcels of land at Reston, Virginia, on which they would build their own separate headquarters buildings, thus melding into a large Educational Park. The CFC Committee had concluded, and so recommended to the Board, that the most desirable future for NSTA was, first, to remain in central, downtown Washington, and second, to build its own building. An architect had been consulted and the committee reported his recommendations, backed up by a small-scale model of a design for a building with approximately three times the space needed by NSTA so that rental of more than half the space could help pay off the mortgage. The report of the CFC Committee concluded with a budget and a time schedule covering fund-raising and construction. The Board unanimously adopted the report, approved the recommendations, and activated the plan.

Unfortunately, no one involved could know or foresee that the country was heading into a recession, which greatly affected the campaign. The response of Life Members to the CFC appeal was excellent, but contributions and pledges from the general membership were disappointingly small. Several of the State Chapters and Affiliated Groups, however, came through with pledges of significant size ($1,000 or so). Most damaging to budget estimates (and to the spirits of the Committee) was the poor response of the business-industry community. In view of the excellent support given to NSTA by this group through 15 years or more, it was expected that some $200,000 would be realized from this source. Actually, the total amount given or pledged after two years of CFC endeavor amounted to only about 10 percent of the goal. In any event, Shamos reported to the Board of Directors in July 1972 that "the CFC is a flop." Actually, it was not a total flop; far from it. In addition to

about $40,000 net (all expenses paid) on deposit in a bank, the exploration of ideas and alternatives for an independent headquarters for NSTA was invaluable experience that produced a useful reservoir of information. The 1972 Board of Directors voted to put a moratorium on CFC, hold the bank deposit in escrow, and "give further study to the question of acquiring an NSTA headquarters."

In 1973-74 President Leslie Trowbridge and Executive Director Silber wasted no time in resuming the action temporarily tabled in 1972. NSTA purchased an existing building in Washington, completely severed all official ties with NEA, and moved lock, stock, and barrel into its own permanent headquarters in July 1974. The September 1974 issue of *The Science Teacher* carried the following report by Silber:

NSTA Chooses a New Home at
1742 Connecticut Avenue, N.W., Washington, D.C. 20009

In a revival of the campaign for a permanent headquarters, NSTA has found and contracted to purchase a comfortable building in downtown Washington. Located on a valuable corner property on Connecticut Avenue near the new Washington Hilton Hotel, the building will be easily accessible for the Association's business contacts, is on good traffic arteries for staff and visitors, and offers attractive and ample office space for the NSTA headquarters staff and for committees working in Washington. Built originally as The Jewett House, a family mansion like so many others in Washington, it has been used as offices of the Washington Area Council of the Boy Scouts of America for nearly twenty years.

The choice of this building culminates several months of searching by Executive Director Robert L. Silber and President Leslie W. Trowbridge. Properties in Washington and in the nearby "new towns" of Columbia, Maryland, and Reston, Virginia, were inspected, and of course the original idea of building an office building in Washington was also reconsidered. In the end it seems that this building offers the advantages of our own building in a strategic location in Washington at far less investment than would be required to build a headquarters. Moreover, with a minimum down payment, the Association has been able to move into the house without the long delays of building. Former President Morris E. Shamos, Roger Hanson, President Trowbridge, and President-elect Rutherford served as a final review committee and recommended the purchase to the NSTA Board of Directors, which officially approved the transaction. The Association staff moved into the building on July 22.

The building and land are to be purchased for $525,000. The Association will begin a fund-raising campaign soon with an appeal to members, business friends, and other sources to support the building drive. Even a modest gift of $10 per member would assure the completion of the down payment on the building.

Offices for the present NSTA staff of 30 persons include space for the Executive Director and other administrative personnel; the business, membership, and magazine circulation staff; the three journals (*Science and Children, The Science Teacher, Journal of College Science Teaching*), the *NSTA News-Bulletin*, and other publications; the convention coordinator's office; and the stock and mail rooms. For the first time in its

history the Association will have a board room for conferences and committee meetings. Gradually also the Association hopes to build a library of reference material for the use of staff and visitors.

Moves also mean leaving old friends. NSTA leaves the NEA Educational Center — its location since the first NSTA headquarters office was established in 1948 — with a certain amount of nostalgia for the many common interests with NEA over the years, for the invaluable contacts with colleagues in NEA and in other former departments and related groups in the NEA building, and for the common services provided by NEA. However, as NEA's focus of interest has changed in recent years, many of the associated groups have left for new quarters elsewhere in the Washington area, and the NEA-NSTA relationship has increasingly become that of landlord and tenant. Ten years ago, NSTA received rent-free space in the NEA building; last year, our rent on space that was far from adequate for our staff, was $20,000. While this is somewhat less than might be the rent in a commercial office building, it is a large part of the NSTA budget, and NEA is increasing its rates for rent. In addition, other services from NEA are costly and may be more economically procured elsewhere.

Other reasons for seeking a new location are that funds directed to our own property will build up equity, which amounts to a savings in the NSTA budget. Ownership of our own building will contribute to NSTA's financial stability.

The building will also generate some income through the rental space and allows for expansion of the staff and Association programs in the future.

Having finally found a permanent location, our next steps are to create a new and stronger identity for NSTA — and that means active interest and individual identification of each member with NSTA. Please visit your new headquarters as soon and as often as you can, whenever you are in Washington. Your new professional address in Washington is 1742 Connecticut Avenue, N.W. 20009.

A dream of nearly 40 years standing had finally come true — NSTA's own Permanent Headquarters in the nation's capital, plus not only an Executive Director but a staff of 30 persons and not one but three association journals.

Organization and Management

Operating or managing the headquarters office was comparable to the same task in most any "small business" organization. Recruiting and hiring staff, preparing job descriptions, organizing for work accomplishment, and "looking after" internal staff relations were subtasks that emerged and evolved through the years. Initially, the Executive Committee was inclined to keep a close watch on all staff members, and one early president felt that "no one should be hired into the office without Executive Committee approval." That was at the time that fear of "Communist infiltration" was rampant throughout the United States. In 1947-48, action by the entire Board of Direc-

tors was required to authorize a $300 salary increase for Bertha Slye. But the impracticality of such close surveillance by the Executive Committee or Board, or even by the President, soon became self-evident. Full authority and responsibility for staffing, organizing, and managing the headquarters office passed into the hands of the Executive Secretary, quickly and without dispute.

In actual practice, proposed new staff positions together with estimated costs for salaries and fringe benefits were included in the proposed budget for the year ahead, which always was reviewed and acted on by the Board of Directors in the annual business meeting. Hence the Executive Secretary always had an approved total sum for staff on which to operate. The selection and hiring of administrative, secretarial, assistant editorial, and clerical personnel were entirely "in-house" responsibilities. As for professional staff, including editors of the three journals, the Executive Secretary recruited, reviewed, and selected proposed persons; these were submitted as recommendations to the Executive Committee, and personnel were officially hired only after and with approval of that body. It is true, however, that never was any of my recommendations rejected. And only twice during my years with NSTA was I "overridden" or "directed" by the Board in matters of staff.

The Washington, D.C. area "labor market" provided practically all of our administrative, secretarial, stenographic, and clerical help throughout the years. But just as with a college or university, we tried to bring in professional staff with a variety of background experiences and from diverse geographical locations. My tally shows that over a period of about twenty-two years, twenty-one persons served in various NSTA positions as Executive Secretary, Assistant or Associate Executive Secretary, Business Administrator, Director of Youth Activity Programs, Elementary Science Specialist, and Editors of the three journals. Seven of these came from the Washington area; that is, from the District of Columbia or nearby Maryland or Virginia. Of the remaining 14, four emigrated from Michigan and two from Illinois; we got one each from Nebraska, Oklahoma, Pennsylvania, Connecticut, Ohio, Wisconsin, Colorado, and Utah. As for their backgrounds, nine came to NSTA directly from high school connections; six left college positions to join our staff; one was a state science supervisor; and the remaining five were enticed away from other professional or business

connections. Our appeal and bargaining position were pretty good, except that we could not compete in the Northeast and Far West because salaries in those regions tended to run 15-20 percent higher than we could afford.

I was always quite proud of our headquarters staff — for their competence, devotion to NSTA, team spirit, and personal qualities. Seldom did we take on a newcomer who did not pan out; dismissals were few and far between. Occasionally, of course, a misfit or incompetent would get the message and resign. We were quite cosmopolitan. At one time, about 1957, we had among our crew of 20 staff members three Negroes, two Filipinos, a Cuban, a Brazilian, one girl of Greek origin, and "a girl from Chicago." I was proud, and considered it a great tribute to NSTA, that at the time of my retirement 10 of our 25 full-time staff members had served continuously for 10 years or more; 5 were veterans of 15 to 20 years with NSTA.

We tried to operate the headquarters group in a democratic fashion. Staff meetings were held frequently, and most questions and issues were resolved by majority vote. Often the incumbent President could join in these meetings. Until 1967 we pretty much followed NEA personnel policies and practices and also the NEA plan of job classification and salary schedules. By 1965 or so, however, our staff had grown and NEA policies and practices were changing to such an extent that we decided to strike out on our own. The staff elected its own Personnel Committee, which in the course of about two years produced two outstanding documents. First was a proposed plan for staff sabbatical leaves, including criteria for eligibility, mutual obligations, and rates of pay. Not limited to professional staff as is customary in colleges and universities (in fact, many such institutions do not have sabbatical leave plans and, of course, such leave is a rarity in public elementary and secondary schools), the proposal was approved by the Board of Directors and became operative during 1968-69. This forward step made NSTA the first association at 1201 Sixteenth St., N.W. to have a written policy on sabbatical leave, something the NEA itself did not have. Several other associations borrowed copies of our statement and initiated steps to follow suit.

The second document of note was a 32-page statement of NSTA Personnel Policies and Practices, including a plan for categorizing all staff positions and delineating related salary schedules. This was developed by a joint committee of staff

and Board representation, including President Simendinger. The statement was approved by the Board of Directors, thus making it an official governing document of the Association. It, too, was used by several other associations as a prototype for their development of similar statements.

Another staff action prior to the two reported above probably should be mentioned. When Donald G. Decker was President, he asked me a few questions about the NSTA staff retirement plan, but I was able to tell him little more than that we were enrolled with the overall plan of the NEA and most of the Departments. A staff committee was chosen to look into the matter, and after a few months of study they recommended that NSTA terminate its relationship with the NEA plan in favor of joining the Teachers Insurance and Annuity Association (TIAA). The staff voted unanimously for the shift, and the Board of Directors approved at its 1960 annual business meeting. This was NSTA's first major breakaway from NEA. We were not the first Department to leave the NEA retirement plan, but our move prompted two or three other associations to follow suit rather soon.

The Role of Presidents

NSTA presidents took the job seriously, worked hard, and even sacrificed to carry out their responsibilities. In addition to responsibilities and involvements as implied in the listing of presidents and highlights year by year (Appendix II), each president was otherwise engaged in ongoing activities of the Association such as committee endeavors, planning conventions and other meetings, corresponding with members, and sharing in problems and decisions in the realm of budget, finance, and administration. Three presidents (Williamson, Shamos, and Trowbridge) devoted at least one quarter or one semester of sabbatical leave to association service at no cost to NSTA beyond expenses. Presidents Smith, Rice, Marean, Ledbetter, and Trowbridge were given full academic year leaves by their employers at a cost to NSTA of approximately one-half of their annual salaries. Hale, DeRose, Lee, Simendinger, Merrill, and Lerner were given "adjusted assignments" for one year that enabled them to travel and take time off as needed in service to NSTA, the cost to the Association being, usually, a modest amount of secretarial help and expenses. The president

of NSTA is a working officer, providing half-time to full-time leadership and service to the association.

Our presidents (rather than staff) frequently represented the Association officially in situations of substantive or ceremonial importance. Smith, Blough, and Lerner by invitation appeared before committees of the U.S. House and Senate to offer testimony or an NSTA position statement on proposed legislation affecting science education. Hale was an invited witness to the White House for the signing of an elementary and secondary education act by President Lyndon B. Johnson. Richardson was NSTA's first representative on the U.S. National Commission for UNESCO, and DeRose in succeeding him became the first high school teacher ever to serve on that body. Williamson served as secretary to the Specialized Committee on Science of the World Confederation of Organizations of the Teaching Profession. Almost every president since 1961 has represented NSTA at the annual meeting of the British Association for Science Education, and Garrett by invitation and with partial expenses provided by the Australian Science Teachers Association gave the keynote address at that year's annual convention. Our presidents have participated in dozens of national conferences and served on special committees of diverse U.S. groups concerned with science education; e.g., the National Assessment of Educational Progress; President Eisenhower's Committee for the Development of Scientists and Engineers; UNESCO conference on pollution and the environment; National Society for the Study of Education; the National Youth Conference on the Atom; "Century 21" (Seattle World's Fair); and International Curriculum Conferences (of Great Britain, Canada, and the United States).

The examples above are cited as partial evidence that NSTA did indeed achieve another early goal of the founding fathers — "a voice for science teachers," so eloquently presented by Morris Meister in the October 1946 issue of *The Science Teacher*. Activities such as these do not, of course, feed back immediately in services to members; they do not help the teacher meet "that third period class next Tuesday." But who would deny that they can give every teacher a lift and a feeling of pride in knowing that *our association* is recognized, respected, and active as the prime agency of *an organized profession*? And that the activities are worthy, well-directed, and significant for reasons far beyond personal, selfish goals.

The choosing of NSTA presidents, members of executive committees, and Board directors has always been an extremely democratic process; well, nearly always. For the first few years the nominating committee pretty well understood that it was to propose presidential candidates in a succession pattern from among the leaders who had worked successfully to form NSTA. Also, that directors for service on the Board were to be nominated from leadership roles in the ten or twelve then cooperating associations. Moreover, only one candidate was named for each position to be filled, but spaces were provided on the ballot for "write-in" votes by members who had other choices. I served on the Nominating Committee in 1946-47 and 1947-48 and went along with this practice. However, at my first meeting with the Executive Committee in December, 1948 (following my appointment in September) I opposed a motion that was offered to instruct the Nominating Committee to "select the general officers from the present Board of Directors in their nominations." My urging was to avoid any practice that could imply a "closed circle" operation. The motion lost by 16 to 2 votes. This was the beginning of the end of posing candidates because they represented a particular association in favor of searching through the membership at large for qualified possibilities. It was not until 1952, however, that the Board of Directors voted an operating policy requiring nominating committees to offer at least two candidates for each position and to eliminate the write-in option.

The Nominating Committees were all presidentially appointed, and numerous considerations entered into the selection of their members so as to achieve balance and broad representation — sex, race, level of teaching, academic or teaching area, geographic location, knowledgeability of Association activities, and so on. Every year the membership at large was encouraged to "send in names" of proposed candidates, and personalized memos were sent to all state science supervisors, presidents of the Sections, State Chapters, and Affiliated Groups, and possibly a few other groups inviting the submission of proposed candidates. Nominating Committees usually added a few names of their own to the pool. I have seen committees review as many as 270 names in the course of producing a final slate of 18 candidates. Neither the President nor the Executive Secretary was an *ex officio* member of this committee, but the Committee always met at headquarters and they never failed to ask me to "sit in" as a source of information

during their preliminary deliberations. I tried to avoid opinions, evaluations, and recommendations of persons, and I always made my exit when the Committee reached the stage of actually settling on the candidates. The lists that they turned in for us in headquarters to process through the balloting by members usually contained several surprises.

Balloting was by mail, and all members were entitled to vote. Names and biographical data about the candidates, and in the last half dozen years a "position statement" by each candidate, were mailed to all individual members. The ballot and a business reply (postage paid) envelope were included. Ballots went to the computer center at the University of Colorado for tally. Voting response of members ranged usually from 40 to 50 percent, which is generally considered to be very good. When votes were closely divided between two candidates, they were all computer tallied a second time for verification. This was not unusual; in fact one presidential contest was decided by one vote and two others by fewer than 20 votes out of five or six thousand total.

The plan or organizational basis for the makeup of the officer structure and the Board of Directors was changed several times during these 30 years of NSTA. Initially, a traditional structure was employed — president, several vice-presidents, treasurer, and recording and corresponding secretaries; plus, of course, 10 to 12 directors, all together comprising the Board of Directors. By 1949-50, a revised pattern was adopted to provide for a President-elect who would automatically succeed to the presidency a year later and then remain on the Executive Committee another (third) year as Retiring President.

As the Association grew and the headquarters functions matured, other changes seemed to follow in due course. The position of Treasurer as an elected officer was dropped in 1963 and the responsibilities were assigned to the Executive Secretary. Related to the rationale for this change, the practice of an appointed audit committee to review the books and financial records each year was soon dropped in favor of hiring a certified public accountant to do the reviewing and to prepare Association reports not only for the Board of Directors but as required for the Internal Revenue Service, the District of Columbia tax office, and two or three of the states in which NSTA "did business" (particularly New York State). During this interim and because of the growing range and complexities of NSTA's endeavors, the Association in 1960 became an incorpo-

rated voluntary "charitable" organization under the laws of the District of Columbia. This move substituted Articles of Incorporation for the Constitution but continued a revised set of Bylaws. One of the beneficial effects of this action was to relieve all officers and staff of any personal liability for Association financial obligations. Blanket bonding of staff was, of course, provided to cover any criminal misuse of funds.

When the position of an elected Secretary was eliminated in 1964, the task of preparing minutes of meetings of the Executive Committee and the Board of Directors was turned over to headquarters staff. To compensate for the lost Treasurer and Secretary, the Executive Committee was enlarged to a body of seven by the addition of four Members-at-Large, two to be elected each year for two-year overlapping terms. Along with this change, the basis for electing Directors was modified from "at-large" to, first (1957), eight "Regional" groupings of states and later (1969), twelve "District" clusters in order to assure reasonably good geographic distribution of the Board of Directors (including territories and "possessions" of the United States). When the latter revision was adopted, voting for District Directors was also restricted to members residing within the respective Districts (rather than "at-large" voting by all members).

Thus during five years through June 1974, the NSTA Executive Committee was comprised of a President, a President-elect, a Retiring President, and four Members-at-Large, all seven having been elected by the total membership. The total Board of Directors was comprised of the Executive Committee plus 12 District Directors, each elected by the members residing within one District. At each annual business meeting, however, these 19 were augmented by a President-elect-elect, 2 Executive Committee members-elect, 6 District Directors-elect, and the Presidents (or designated representatives) of the 5 Sections of NSTA — a total of at least 33 persons, "at least," because frequently other invited committee chairmen or other representation would be present. The Section representatives and invited guests were free to participate in discussions but were ineligible to vote on questions, issues, or motions.

After more than 25 years of evolution and half a dozen times of polling the membership (because every change in Board structure required a Bylaw change, and each proposition had to be referred to the membership by mail ballot — at a cost

of up to $7,000 for printing and postage), you might think that perfection had been achieved, at least a pattern that was working, that the rank and file members seemed satisfied with, and that could be lived with for, say, another 10 or 20 years. Well, you might think so, but you would be wrong.

In 1972 still another revision was proposed and argued during the annual meeting of the Board. The rationale, as I understood it, was about as follows. The Board of Directors is to be the *policy-making* body of the Association. The Executive Committee is to be the *administrative* or executive body charged by the Bylaws to *act for* the Board during the year in all matters requiring consultation and decisions beyond presidential prerogatives. The Executive Committee is established to be responsible and accountable to the Board. But, the proponents of change argued, the Executive Committee is now elected separately and independently of the District Directors and in truth, they claimed, tends to act *apart from* rather than as *part of* the total Board. The proposed revision, designed to eliminate this situation and to make the Executive Committee the creation of and more clearly responsible to the Board, was fairly simple: Eliminate the present 4 at-large positions on the Executive Committee and, instead, let the 12 District Directors and 6 Directors-elect at each Board meeting choose *their own four representatives* who, together with "the three presidents," would serve as *their* Executive Committee for the ensuing year.

The proposed change was presented and argued in 1972—and was voted down. At the 1973 Board meeting the idea was again introduced for debate and again was rejected. By late 1974, however, a special committee had developed a proposed reorganization which, if approved by the Board and then approved by the voting membership, would bring about the most drastic changes in NSTA structure and in its relations with the Sections in 30 years. Major features of the proposed new structure were as follows:

1. Four NSTA divisions are established to represent *levels* of education (pre-school and elementary, middle and junior high school, high school, and college), and three to represent *functions* (research, supervision, teacher education). There will continue to be 12 geographic districts.
2. State chapters will continue as now, but "sections" will be discontinued. In their stead will be division affiliates and associated groups. Presidents of division affiliates (AETS, CESI, NARST [pending approval], NSSA) will serve on the NSTA board of directors, and the NSTA president (or delegate) on theirs.
3. In place of four "at-large" members of the board there will be seven division directors elected at large by the membership.

> 4. There will be 17 standing committees, which are to meet once a year. Every district director will serve on one standing committee, and will act as liaison between that committee and the NSTA board of directors.[2]

This radical reorganization would produce a total 26-member Board of Directors comprised of:

The President
The President-elect
The Retiring President
12 District Directors
7 Directors-at-large
4 Division Affiliate Presidents

An Executive Committee would be named by the Board to include "the three Presidents" plus four Directors chosen by the Board. Thus the proposal for change in the makeup of the Executive Committee that was rejected in 1972 and again in 1973 will have been accomplished.

My prediction is that this proposed reorganization will meet with approval. [Editor's note: It was approved in 1975.] The membership in general has great confidence in the special committees that study such propositions and make recommendations, and seldom, if ever, have such recommendations been rejected. This particular proposal strikes me as a big step forward in that it not only clearly recognizes four main levels of science education and three of the principal *functions* of practitioners other than classroom teachers. Perhaps more important it assures representation on the Board for all of these categories at all times and in a relationship that should further strengthen the Association effort to overcome divisiveness and watertight compartments in pursuit of a united total profession and common-cause endeavors in science education. I must say, however, that as an observer of Executive Committee actions throughout 25 years, I do not believe that any Executive Committee ever felt aloof, or superior, or independent of the total Board of which it was a part. There were, no doubt, some instances calling for decisions in which action by the Executive Committee could be interpreted as establishing a policy position, but, I would say, always with broad policies and central purposes of the Association in mind. Many times — in fact, usually — such actions of the Executive Committee were submitted to the Board by mail ballot for ratification. Occasionally some Board members (Directors)

[2]*The Science Teacher*, September 1975, p. 60.

would object to this and argue that all such questions should be "held over" for face-to-face discussion and voting at the annual Board meeting. The cost of this would be delay, inaction, and lost opportunities and, in the end, probably no different or wiser decision anyway. I doubt that the proposed change in *makeup* of the Executive Committee will change the *responsibilities* of this group or alter its relation to the total Board very much.

As for organization of the headquarters staff, that was a matter left entirely in the hands of the Executive Secretary. Current structure and proposed changes, additions, or reductions in force were usually discussed with the President, often with the Executive Committee, and sometimes with the entire Board. The rationale for these practices was in recognition of the Board as a policy-making group on large issues, alternatives for action, and program and budget establishment — but *not* as a group empowered, or even entitled, to intrude into administrative or managerial structure and operation. At least four presidents (DeRose, Lee, Shamos, and Garrett) argued vigorously for this point of view when threats of intrusion into staff organization by the Board arose on a few occasions. The recognition of the President, the Executive Secretary, and the Executive Committee as having well-defined responsibilities as administrative agents of the Board prevailed without, really, very much disagreement.

Budgets, Dollars, and Problems

References have already been made to NSTA financial ups and downs through the years. I discovered very early that looking after the small business aspect of our operations was indeed a major component of the job description of the Executive Secretary. On no less than perhaps a dozen occasions during 1948-73, our financial plight reached such a low ebb that I feared bankruptcy. In each instance the worrisome state of affairs persisted over as much as six to eight months of the fiscal year. Amazing it is that we not only sweated out these troublesome times, but grew, expanded our services, publications, and staff, and showed a cash assets balance (on-hand or in-the-bank) of $247,446 at the end of fiscal 1973. At the end of 1969, total cash assets had amounted to −$28,506 (note the minus sign!). The record demonstrates that NSTA sources of

support (total income) were sound and dependable, though often slow in coming through; also, that the Presidents, Executive Committees, and staff performed in no amateurish manner in managing the business affairs of the Association. What the record does not show, however, is that the NEA really served as our banker during dozens of lean months and years, continuing to meet our payroll, pay printing bills for the journals, and so on even when our cash balances were deficits of 20 to 80 thousand dollars. Without this support I do not know how we could have survived.

Already recorded in this history of NSTA is the fact that NEA financial aid made possible some of the early committee activities that led to our founding and that NEA grants for a three-year period enabled the Association to employ an Executive Secretary and set up the Washington headquarters office. There were also NEA grants ($3500) in the mid-1940s to underwrite a number of Leadership Institutes in various places in the United States. These were significant in that they led to the informing of many persons with "the gospel" of NSTA and the enlistment of disciples or ambassadors who recruited among science teachers for member-followers. As the membership grew, the base and strength of appeal to other sources of dollar support became larger and more productive. In every year since 1948, however, the dollar income from memberships and subscriptions was less than half the total income budget; in at least half of these years, the member-subscriber fraction was only one-fourth to one-third. Understandable, then, that we continually chanted, "Every dollar invested in an NSTA membership or subscription helps unlock two to three dollars from other sources for the support of Association programs and services."

The NEA also helped our Association in two risk adventures with quite uncertain futures. First was the purchase in 1950 of *The Science Teacher* from John C. Chiddix. Sale and transfer of title to NSTA was set at $4,000 — an amount which NSTA did not have but which we were able to borrow, interest-free, from NEA. It took ten years to pay off the loan. The second big gamble with fingers crossed was the launching of *Science and Children* in 1963. This time it was a loan of $15,000 at 3 percent interes (the NEA was getting tougher, charging interest!). The new journal caught on rapidly; subscriptions and advertising brought in substantial support — and this time the NEA loan was paid off in only three years. When, however,

it was decided to launch the *Journal of College Science Teaching*, even the NEA was no longer a source of help, and it was loans of $500 to $1,000 each by about 60 Association members that enabled us to move ahead.

Journal advertising income was absolutely essential for the support and maintenance of the size, frequency, and physical qualities of all three journals. Consider only *The Science Teacher*. The association transformed this periodical from a 6 × 9 inch, 4-times a year, 48-page magazine when purchased to one of 8½ × 11 inches, 9 times a year, and 72 pages or more per issue by 1965 — from 20,736 sq in of page area per year to 605,880 sq in per year! Advertising income for *The Science Teacher* and *Science and Children* during one of the better years amounted to approximately $160,000.

Two other forms of income from advertising through the use of Association channels were derived from the use of the U.S. Registry of Secondary School Science and Mathematics Teaching Personnel (an NSTA mailing list of approximately 200,000 teachers of science, mathematics, and social studies in secondary schools) and from the sale of exhibit space at meetings of the Association. Over a period of 10 years, Registry income averaged more than $100,000 per year. Exhibit income for the national convention and for three area conventions in 1972-73 totaled $108,000. To sum up, these three sources of income — journal advertising, use of the Registry, and exhibits at meetings — produced approximately $300,000 per year to bolster Association resources for carrying on its extensive array of services and activities.

From the earliest days of NSTA, cooperation and financial support from a hundred or more business-industry organizations (companies, corporations, trade associations) proved invaluable to the development and proliferation of Association endeavors. The Packet Service, inaugurated in 1947, provided NSTA members with an unbroken flow of evaluated and approved business-sponsored teaching materials (booklets, charts, films, career information, *but no "try it and buy it" sales promotion*) for 20 years — 80 Packets in all and 6 to 10 items in each one. Participating sponsors paid proportionate fees for the distribution of their materials, and this evaluation-distribution service enhanced the treasury of NSTA with 20 to 30 thousand dollars a year. The original Packet Service was discontinued in 1968, primarily because of the dwindling supply of eligible materials. However, the concept was reactivated successfully

in 1970 in the form of an Elementary Science Packet service. As the name implies, materials and information germane to the teaching of elementary school science are reviewed, selected, and distributed, and the mailings are a rifle-bullet service primarily to elementary members. Participants pay the costs of operation and "a little bit over" as an "operational margin."

NSTA's Future Scientists of America (FSA) programs for students and teachers were about 90 percent possible through the support of business-industry, the other 10 percent coming from a few scientific societies. Also several special programs for science-prone students have been funded by the National Aeronautics and Space Administration (NASA). During the heyday of FSA activities (1954 until about 1964), as many as 40 to 50 companies and corporations each year made supporting contributions ranging from $200 to $3,000 for annual totals between 30 and 50 thousand dollars. Seven Summer Conferences for Science Teachers, held under the FSA banner, were made possible by $15,000 grants from companies within just one segment of business-industry; namely, paper and pulp. Interesting what an ambassador can do for you: Harry F. Lewis, Director of the Institute of Paper Chemistry, Appleton, Wisconsin, a former high school teacher and college professor of chemistry, was active in the American Chemical Society's Division of Chemical Education, and was much concerned about the quality of high school science education. He had heard about and became a member of NSTA, and "had connections" with industry personnel who were likewise interested in better science teaching. It was he who generated the seven summer conferences. However, instead of focusing only on chemistry teachers and operating through the ACS as might have been expected, Lewis and his industry colleagues chose to work through NSTA and open the door to all secondary school science teachers (although two of the conferences were limited to chemistry teachers).

Beyond those activities carried on as part of the FSA program, several special projects of considerable significance were made possible by support from business-industry sources. The International Business Machines Corporation provided grants of about $150,000 for a project on information processing that resulted in the production and distribution of more than 200,000 copies of three student and teacher publications about theory and uses of computers. Two separate studies of secondary school science teaching facilities by NSTA committees

were done with enabling funds ($4500 and $20,000, respectively) provided by the Laboratory Equipment Section of the Scientific Apparatus Makers Association. An NSTA fact-finding study of the teaching about nuclear energy and power in secondary schools was conducted under a grant of $11,500 from the Atomic Industrial Forum. The Science Seminars (short courses for continuing education in science) as a feature of the national convention have been sponsored and paid for ($10,000 per year) by the Sun Oil Company, beginning in 1968. Other examples could also be cited, but those mentioned thus far give a good picture of the variety of ideas that were B-I supported and the range, magnitude, and significance of that support. For more detail on these and other B-I programs, see Chapter 6.

As for programs directed specifically to students, those that drew the strongest and most prolonged support were, first, the annual awards for reports of science projects and, second, the student science congresses. The American Society for Metals sponsored the FSA Awards for Students for ten years with annual grants of $10,000, and Ford Motor Company then picked up the sponsorship to the tune of $25,000 to $35,000 a year for six years. In revised format and under the name of Tomorrow's Scientists and Engineers (TSE), the student awards program ran three more years with Standard Oil Company (New Jersey) and Humble Oil and Refining Company as sponsors and with annual budgets of $135,000. The NASA-NSTA Youth Science Congresses went on for 10 years with $50,000 to $90,000 available each year from NASA. A special, one time only joint endeavor of NASA and NSTA was the Skylab Student Project, which cost NASA about $125,000. For more detail on the Youth Activities Programs, see Chapter 4.

Other government agencies also supported a variety of NSTA proposals. (See also Chapter 6.) The National Cancer Institute (NCI), one of the National Institutes of Health, was first on the scene with alternate-year grants of about $40,000 as sponsor of the Science Teaching Achievement Recognition (STAR) awards beginning in 1956. After a short lapse, the STAR awards program was picked up in 1969 by the American Gas Association and is still operative under annual grants of $5,000. In 1960, NCI gave us a grant of about $120,000 to carry out a project to produce six science career information and guidance films for junior and senior high school levels. The National Science Foundation (NSF) supported mid-1950 conferences on secondary-school science and elementary-school

science (about $15,000 each), provided $2500 in 1960 to help begin the still-continuing exchange visits of officers for the annual meetings of NSTA and the British Association for Science Education. Over a four-year period in the early 1960s NSF made grants of 40 to 50 thousand dollars to help establish the U.S. Registry of Science, Mathematics, and Social Studies Teachers. For three years (1971-73), NSF grants of $18,000 to $24,000 enabled the Association to include an extensive array of special workshops, field trips, and continuing education "short courses" in the programs of three area conventions each year. An NSF grant of about $90,000 made possible a searching inquiry and on-site field studies of exemplary science teaching facilities, conducted during 1970-71. NSTA and the American Association for Health, Physical Education, and Recreation were co-recipients of a grant of $100,000 from the National Institute of Mental Health for a 1968-69 joint project on drug use-abuse education. More modest support in the earlier days of NSTA enabled us to hold a conference in cooperation with the Civil Defense Administration, cooperate with the International Geophysical Year, and work with the Atomic Energy Commission in the preparation of science teaching materials.

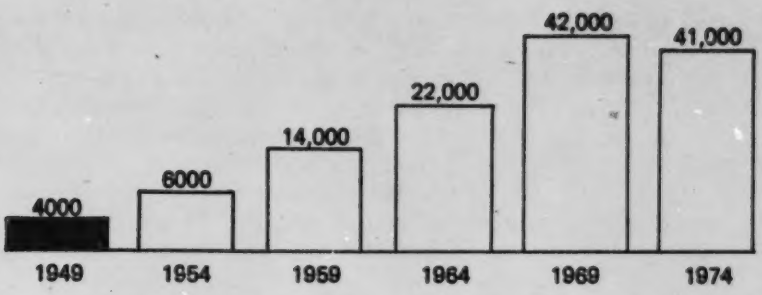
We fared pretty well and not so well when it came to grants from the U.S. Office of Education (USOE) and private foundations. Actually, USOE was seldom regarded as a promising source of funds for the kinds of projects NSTA wished to undertake, and no more than five or six proposals were submitted to this agency in all my years with the association. Three were funded: a project to elaborate the notion of conceptual schemes of science as previously published in *Theory Into Action in Science Curriculum Development* (about $40,000), a project concerning instructional and supervisory uses of educational technology (about $130,000), and a task force study of the first-round findings in science of the National Assessment of Educational Progress (NAEP) (about $35,000). We had but little support from the private foundations such as the Ford Foundation, the Fund for the Advancement of Education, and the Carnegie Corporation — all of which had opportunities to support NSTA proposals but declined. In 1971, however, the Fels Foundation made a grant of $18,000 on a matching funds basis (matched by smaller contributions from five B-I sources plus $10,000 or so allocated by the Association) for a project resulting in *Guidelines for Self-Assessment of Secondary-School Science Programs*.

This review of the record shows without question that a large portion, probably more than half, of the totality of NSTA endeavors throughout 30 years was possible only because of external funding and cooperation. Without massive dollar support from government agencies, professional and trade associations, and business-industry sources there would have been no FSA programs, no *Vistas of Science* books for youth, no programs of awards for teachers or students, no Youth Science Congresses or Skylab Student Project; not one of more than twenty special conferences and seminars (with most of them resulting in professional publications) could have been held. The self-assessment project, the study of NAEP findings in science, three studies of science teaching facilities, the drug abuse project, and several similar projects would have been mere dreams lost in the cold light of inadequate resources. How many dollars came to NSTA from these sources for such purposes has not been totaled to the last digit. My own estimate, which I truly believe is fairly accurate, places the figure at just about three million dollars.

Now three million dollars spread out over 30 years is not a huge sum, really. I believe NSTA may rightly claim that "no other organization has done so much with so little." Particularly when we realize that members and subscribers paid in only about the same amount.

This lengthy review and my obvious praise of the cooperating organizations and agencies that have supported NSTA endeavors through the years is by no means to be interpreted as denigrating the support accorded by the members. Their strength in numbers, their volume of membership dollars paid in, and their active participation in diverse ways in dozens of Association programs form the very cornerstone of the NSTA enterprise. Without members and subscribers, there is no Association; all is lost before it ever begins. Fortunately, the services, activities, and participation opportunities offered by NSTA early attracted a loyal following that grew rapidly to substantial, even impressive, numbers. This growth through the years is shown in the following chart (member-subscriber totals "rounded off" to nearest thousands as of May 31 of the years indicated).

The three million dollars, more or less, paid into the Association treasury by members and subscribers during 30 years was the dependable, hard core of NSTA financing. This money together with an equal or greater amount from advertising and



exhibits made possible the central program elements of the Association — maintenance of the headquarters and staff, publication of the three journals, the production of national and area conventions, and the conduct of committee activities. But over and beyond the dollar support of members, it was their response, enthusiasm, and participation that kept going such externally funded programs as the FSA and TSE student awards, the STAR and Ohaus Awards for Teachers, the Youth Science Congresses, and so on. It is true, of course, that many nonmember teachers also participated in these programs (the door was never marked "members only"), but it seems probable that they learned of the opportunities and were encouraged through NSTA-member colleagues.

Our Life Members in particular responded generously to calls for help in times of great need. We became much concerned to eliminate our debt to NEA that persisted several years following the purchase of *The Science Teacher*. Combining a few annual operating deficits with the purchase loan of $4,000, we owed the NEA some $20,000 within five or six years. At the 1958 convention in Denver, Phil Johnson spearheaded a Debt Reduction Campaign at the Life Members' Breakfast; $2,000 was contributed or pledged on the spot. By 1960, the campaign produced about $10,000 and this, together with some frugal budgeting during the interval, enabled President Robert A. Rice to "burn the mortgage" at the 1961 convention banquet session; the debt had been completely amortized. Life Members contributed or pledged approximately $25,000 to the Capital Fund Campaign during 1968-70 and thus helped significantly toward the purchase of the present NSTA headquarters building. Their support in other ways has been invaluable.

Through all 30 years of NSTA history, what I would call three unwritten policies have served to guide Boards of Direc-

tors in their designs of programs and budgets. First was a strong commitment to investing as many dollars as possible in the improvement and extension of services and projects for members and the profession at large. Second was the recognition of the fact that certain risk ventures would have to be undertaken; that some expenditures of funds not presently in the treasury would have to be authorized if the Association's central purposes were to be achieved. It is fortunate, I think, that the admonition of one director was firmly rejected; he advised, "Don't spend one dime for anything until you have two dimes in the bank." The third guideline was to seek solvency but not attempt to build up a large reserve fund at the expense of slowing down growth and development. My own goal on this score was a cash balance of 50 to 100 thousand dollars in the operating account and a reserve fund of approximately 20 percent of the annual budget; for a budget of one million dollars, the total would be $250,000. The 1974 year-end report showed total expenditures of $1,185,800 and an operational balance of $67,332. The reserve fund contained $183,495. However, only $67,610 of this really belonged to NSTA; the balance ($115,885) was comprised of dedicated funds held in escrow for specific purposes. Even so, what a far cry from 1944 and the first decade or so of NSTA finances!

3

A Voice for Science Teachers and for the Profession

The 1944 version of the NSTA Constitution contained the following definition of Purposes (Article II).

> Section 1. The general purpose of the National Science Teachers Association shall be to stimulate, improve, and coordinate science teaching at elementary, secondary, and collegiate levels of instruction.
>
> Section 2. The general aims which are to be pursued in attempts to achieve the general purpose are as follows:
>
> (a) To make the influence of science teacher organizations a potent force through the unification of their efforts.
>
> (b) To initiate and maintain a national effort by scientists and educators to the end that the sciences may be given a just and reasonable opportunity to serve the needs of all youth and adults.
>
> (c) To plan a long range program for the improvement of science teaching.
>
> (d) To assist scientists and science teachers to work together and have a voice along with other groups, such as teachers in other subject matter fields, supervisors, and administrators in defining plans and policies for public education.
>
> (e) To stimulate widespread and intelligent cooperative action on problems related to science teaching.

By 1960, after several revisions of the Constitution and Bylaws and with the act of incorporation of the Association under the laws of the District of Columbia on July 1 of that year, the Objects and Purposes of the Association were set forth as follows (statement in the Certificate of Incorporation and Article II of the Bylaws):

> To stimulate, improve, and coordinate science teaching at all levels and to engage in any and all activities in furtherance thereof; to promote the improvement of educational systems and processes in any manner to assist such stimulation and coordination of science teaching; to apprise the general public of means of improving science teaching within the schools; and generally to do any and all acts and things which may increase, through education, the knowledge of science devolving upon the general public and the betterment of the general public through such knowledge of science.

If you were a member of the board of directors of an association with this statement as its charge — as its legal and moral

obligation, what would you advocate and seek to do in pursuit of these "objects and purposes"? A hypothetical question, of course; yet that is what everyone who ever served on an NSTA Board of Directors should have pondered. Most did, and the Presidents managed to keep the Boards of Directors on track as through the years they have established mechanisms that have produced an impressive procession of position statements, guidelines, and other documents or actions supportive of science teachers and the science teaching profession.

Policies and Issues

The first effort to write a definitive paper seems to have been a document titled *The Platform For Action*, published in 1945. Although more a statement of what the new organization proposed to do than a statement of positions on issues of the day, the document did serve to enlist members who were sympathetic to "the cause," and thus the ideas were propagated as supportive members began to interact, recruit, and increase in number. Among the aims and promises listed in *The Platform For Action* were the following, all of which were realized in significant measure in later years through pronouncements and actions of the Association.

- A complete and substantial program of science instruction K-12
- Policies and standards in respect to laboratory work, apparatus and equipment, science clubs and extra-curricular activities, and the discovery and development of science talent
- Helping decrease the lag between developments in scientific research and industrial laboratories and the work in science classrooms
- Policies in respect to coordination of vocational and general education in science, betterment of international relations and intercultural relations through science teaching, utilization of science for solving human (social) problems and human betterment, and consumer education

These excerpts are sufficient to demonstrate that from the outset, the early officers of NSTA believed that they could "sell" the Association on the basis of what it *stands* for and what it is *doing* in behalf of science education at large at least equally as well as on the basis of direct membership services to help teachers vocationally in their daily tasks. Based on correspondence and conversations with members and observations of Board meetings through the years, I realize that there are opposing schools of thought on how and to what extent to apportion our resources between these two arenas of action. Certainly

membership services must be provided, but I am totally confident that the bulk of the membership wants, expects, and is ready to help the Association assume a leadership role and attempt vigorous action in the realm of "supporting and advancing the profession."

One of the early calls for an official policy committee within the structure of the Association was presented at the 1951 Board meeting by James G. Harlow (formerly a junior high school teacher in Oklahoma City, now president of the University of West Virginia). His argument was that such a committee could discuss

> The problems of organizational purpose and the maintenance of unity of purpose and sound evaluation of organizational progress ... Such a policy statement would provide the formal structure in which to carry on budget planning and project planning ... a policies commission which would be invested with the task of formulation of policy statements and the judicial interpretation of budget proposals and project proposals in terms of formulated aims and policies.

President Lefler supported this proposal, and it was accepted by the Board by consensus as a recommendation to incoming President Arthur O. Baker. His Policies Committee thus was the first of its kind in the history of NSTA; its report, given in full below, was formally adopted at the 1952 meeting of the Board of Directors.

> The Policies Committee of the National Science Teachers Association believes that science education in the public schools is entirely continuous with the remainder of public education, and that science education must therefore share responsibility for and participate in the achievement of the humanitarian and democratic aims which characterize best public education in the United States. It calls upon all science teachers to plan and to execute their contributions to public education in full cooperation with their colleagues in other educational fields. The Committee believes, however, that science teachers, like other special area teachers, contribute uniquely to the educational effort to achieve those humanitarian and democratic aims, and that those special contributions, formulated in terms of specific aims for science education, constitute a valid set of guideposts for the design and conduct of present and future programs of action of the National Science Teachers Association.
>
> The Committee further recognizes that the professional effort of the National Science Teachers Association is a part of the total professional effort of the teaching staff of the United States, and that for maximum effectiveness, NSTA's effort must mesh with the professional efforts of other teachers associations of the nation. Consequently, the Committee has selected the Centennial Action Program of the NEA as the principal program with which the NSTA effort must be integrated, and has drawn freely from the NEA goals for the Centennial Action Program in formulating the statements of the goals for NSTA which are proposed below.
>
> The Policies Committee believes these statements to embody the most nearly valid special objectives for science education in the public schools in

the United States today, and therefore proposes them for adoption as the basic educational aims of the Association:

1. The development of effective personal adjustment consistent with current scientific knowledge of the physical and biological environment, as a means toward achieving confidence and security in the world of today.
2. The development, by each young person, of the habit of seeking the most reliable data to be used as a basis for discussion and in the determination of group and individual action.
3. The achievement, by all youth, of a clear understanding of the crucial dependence of the socio-economic life of the United States on the scientific and technological enterprise.
4. The location and support of those young people who show promise of growing into productivity in the scientific endeavor.

The Committee believes the achievement of these special science education objectives to be so necessary to the continued political and economic health of the United States that it proposes for the central aim of the Association, until the aim is substantially achieved:

5. The establishment of adequate science education opportunity, in terms of the objectives above, for each child and youth at each grade level from one through twelve.

The Committee further believes that, in view of the present situation in science education in the United States, the achievement of this central aim requires the establishment of the following contributory Association aims:

6. An adequate science education supervisory staff in each state department of education.
7. A professionally prepared and competent person in every science teaching position.

The Committee holds that the most promising means by which to move toward the achievement of the two contributory aims and the central aim is through cooperation of interested and competent persons throughout the nation. It therefore proposes as specific and immediate Association goals:

8. A strong and effective state science teachers association in every state.
9. A larger and more effective National Science Teachers Association.
10. Broader participation of state science education leaders in the formulation and execution of national association policies.

— *The Science Teacher*, October 1952, p. 235.

This statement served the Association satisfactorily for nine years. In 1960, President Rice named a Policies Committee to review the 1952 statement and make recommendations. This committee's report was devoted largely to reiterating the 1952 statement in revised format and with elaborative paragraphs. It concluded with a few "for example" statements of kinds the Committee thought the Board might want by way of enlargements and extensions. The Committee, with some changes in membership continued for three more years. Its reports at each of these annual Board meetings were "accepted" and put on file, but nothing was adopted to supersede the comprehensive statements of 1952, and in 1965, the Board accepted the Committee's recommendations to discontinue efforts to produce position statements of such broad scope.

Only one year later the idea in modified form was resurrected by President James V. DeRose. "I wish to recommend," he said to the Board, "the creation of a five-member Committee on Issues charged with (a) the responsibility of studying whatever issues or concerns (of the membership) are in order, (b) presenting a complete analysis of the issue with arguments for and/or against, and (c) making recommendations to the Board on the position NSTA should assume if any." The 1966 Board adopted the proposal and President Addison E. Lee (1966-67) appointed the first Committee on Issues of Great Concern with Morris H. Shamos as chairman. When Shamos became president the next year, he appointed Arnold B. Grobman of Rutgers University as chairman, and it was this committee that produced NSTA's first set of position statements on issues.

In practice, the committees year by year have first developed their own sets of proposed position statements and then submitted these for reaction, debate, and suggested modifications in open discussion groups at conventions and other meetings of the Association (including meetings of some of the State Chapters and Affiliated Groups). With the input from these sessions in mind (and, of course, a good many additional issues of concern on file for future consideration), the committees then developed sets of revised statements for presentation for Board actions. There have been variations in practice along the way, but the essential elements of procedure have been as described ever since 1967.

The first set of position statements on "issues of great concern" to be added to the gospel of NSTA was proposed by the committee and adopted by the Board in 1968. Six in number, the statements dealt with The Use of Natural Resources in Science Teaching; The Use of Live Animals in the Science Classroom; The Teaching of Human Reproduction; Science Fairs; The Liability of Teachers for Laboratory Safety and Field Trips; and the then-pending proposed National Assessment of Educational Progress (*TST*, November 1968; pp. 43-44). Through the years since then, position statements proposed by committees and adopted by Boards of Directors have dealt with the following issues: Conversion to the Metric System; Instruction in Human Sexuality; Social Implications of Science Teaching; Implementation of Curricular and Instructional Changes; Education for Environmental Quality; Drugs, Alcohol, and Tobacco; Research on Science Teaching Facilities; Accountability; and Women in Science Education.

In 1970, President Richard J. Merrill appointed an *ad hoc* commission to prepare a policy statement on guidelines for the use of live animals in classroom teaching and in individual projects or investigations by students. The report, with approval by the Board of Directors, was published as "An Open Letter to Science Teachers on the Use of Live Animals in Science Teaching" (*TST*, October 1970; pp. 10-11). More than 200,000 reprints of the report were distributed by the Association — mostly to teachers and students participating in the various awards programs and in bulk lots to state supervisors of science and State Chapters and Affiliated Groups for further distribution through their respective channels.

It will never be known to what extent or in what ways these policy and position statements were used and found helpful by members or others outside the Association. There is no "thermometer" one can stick into the body politic of the profession and get a reading. We do know, however, that at open sessions conducted by Issues Committees at national and area conventions attendance was good and discussions were lively, indicating support, encouragement, and appreciation for the efforts of the committees. Certainly the various Boards of Directors felt almost unanimously that the efforts and the results were a worthy endeavor that should continue. There were criticisms along the way, but always in terms of improving, not terminating, the Issues Committee procedures.

The NSTA Impact on Curriculum

The National Science Teachers Association has compiled an impressive record in regard to what is probably *the* central purpose of the organization; namely, the improvement of science education at all educational levels by curricular change. Through the years, NSTA has been a forceful and productive challenger of curriculum concepts and content, and its challenges have been issued in a variety of ways: through the pages of its journals, in the themes and forums of its conventions, by special conferences and reports, in topical publications, and through cooperation with other agencies and professional groups. Moreover, the targets of its challenges have extended far beyond the membership and the science teaching profession at large. Hundreds of thousands of copies of selected reports, bulletins, and position papers on curriculum have been chan-

neled to school superintendents, elementary and secondary school principals, state and local supervisors, and to the directors of summer and academic year institutes for science teachers sponsored by the National Science Foundation, the directors of the many curriculum development projects, and the directors of special projects such as the National Assessment of Educational Progress.

The NSTA output of curriculum-related special publications began with a booklet entitled *The Place of Science in the Education of the Consumer* (1945). This publication was prepared by invitation of and with funding from the Consumer Education Study of the National Association of Secondary-School Principals (NASSP). It appears to have been the first publication developed entirely within our Association.

The next significant effort to point directions for the improvement of science education was also a cooperative endeavor of NSTA and NASSP. Titled "Science in Secondary Schools Today," it was published as the January 1953 issue of *The Bulletin* of NASSP and, of course, was distributed to all 16,000 members of that association. First draft of the document was prepared by an NSTA committee, and this preliminary edition was circulated to some 300 science teachers, science supervisors, and college science educators for review, comments, and suggestions. From their reactions, the committee and an NASSP editor prepared the final publication. These procedures, by the way, illustrate procedures commonly used by NSTA to elicit, consider, and include the ideas and experiences of on-the-job practitioners in all facets of science education when preparing publications, policy statements, and position papers.

A more consistent flow of curriculum materials got under way during the late 1950s and has continued to this day. Illustrative of Association concerns and actions over this 15-year period are the following.

1958 — *It's Time for Better Elementary School Science.* Produced by a special conference group; supported by the National Science Foundation; chaired by Glenn O. Blough.

1959 — *Science for the Academically Talented Student in the Secondary School.* Conference report of an NSTA team cooperating with the NEA Project on the Academically Talented Student; supported by the Fund for the Advancement of Education.

1959 — *Planning for Excellence in Secondary School Science.* Report of an invitational conference; funding by the National Science Foundation; chaired by Robert Stollberg.

1960 — *New Developments in High School Science Teaching.* Report of survey-type study; supported by the Shell Companies Foundation.

1960 — *Quality Science for Secondary Schools.* Prepared by an NSTA committee in cooperation with National Association of Secondary-School Principals; first released as an issue of *NASSP Bulletin*; distributed to approximately 18,000 members of NASSP.

1960 — *Rethinking Science Education.* Fifty-ninth Yearbook of the National Society for the Study of Education; prepared under direction of an NSTA committee; chaired by J. Darrell Barnard.

1962 — *The NSTA Position on Curriculum Development in Science.* Prepared by the Association's Curriculum Committee; published in *The Science Teacher,* December 1962; pp. 32-37; several thousand reprints widely circulated.

1963 — *New Developments in Elementary School Science.* Report of a staff survey-type study; supported by the Shell Companies Foundation.

1964 — *Theory Into Action in Science Curriculum Development.* Developed by the Curriculum Committee as an elaboration of the 1962 position statement; approximately 10,000 copies sold over 5-year period; included a section on "Conceptual Schemes and the Process of Science," which resulted from an NSTA Conference of Scientists (18 eminent representatives from seven disciplinary areas) and was published in *The Science Teacher,* October 1964; pp. 10-13.

1967 — NSTA contributed one chapter to *Curriculum Handbook for School Administrators.* Published by the American Association of School Administrators; distributed to 14,000 members of AASA.

1968 — *Steps Toward Scientific Literacy.* Composite report of four conferences for college teachers of science planned and conducted as NSTA staff activities under direction of Associate Executive Secretary Albert F. Eiss; first NSTA publication expressly for college teachers.

1969 — *Designs for Progress in Science Education.* Prepared by special committee as part of commemoration of NSTA's Silver Anniversary Year; 5,000 copies distributed.

1971 — *School Science Education for the 70's.* The NSTA Committee on Curriculum Studies K-12 re-examined the 1962 position statement and produced this revised statement; adopted by the Board of Directors as the official stance of the Association on matters of science curriculum development; still operative, 1974.

If one again asks the question, "How useful, how influential were these documents?", the answer again has to be, "There's no way to know." Any try at being specific would be sheer speculation. Since nearly all topical publications of NSTA are issued as "for sale" items, the willingness of science teachers and others to purchase copies might be construed as at least an indicator of interest. Usually, the initial printing of a publication supplied us with 5,000 copies, and re-runs were usually two to three thousand copies each. Most publications went through one or two reprints, and a few survived three or four. It could be said that on the average, NSTA special publications sales reached eight to ten thousand copies — not an overwhelming figure, perhaps, but probably not insignificant either, assuming that they were not ordered to be discarded without thoughtful consideration and that in all likelihood more than one user — perhaps the entire science faculty of a given school — perused the purchased copy.

From direct, personal experience, I am confident that the 1962 curriculum position statement and the publication *Theory Into Action* formed the most influential "one, two" curriculum punch ever delivered by NSTA. John Marean (President 1962-63) and I were present at the very first meeting called by the Educational Testing Service in Princeton, New Jersey (1965) for the purpose of beginning the definition of science teaching objectives on which to base evaluative questions and exercises for the forthcoming National Assessment of Educational Progress (NAEP). In this meeting and in other planning sessions of NAEP in which I participated during the following three or four years (as did several other NSTA leaders and past presidents), the NSTA curriculum position statement and *Theory Into Action* were the most highly respected, most heavily used or referred to documents considered by the respective groups and committees. For better or for worse, both the first-round assessment in 1969-70 and the second-round assessment in 1972-73 were based largely on NSTA beliefs about science education as set forth in those two documents. One commercial publishing

house brought out an elementary-junior high science textbook series under the general title, *Concepts in Science*, with considerable recognition of the NSTA conceptual schemes of science idea as proposed in *Theory Into Action*. Other publishers, too, stressed the attention and treatment given to "science concepts" in their respective textbooks (for verification of this statement, browse through their advertising in *The Science Teacher* and *Science and Children* during 1966-70 or so).

One particular paragraph in the 1962 position statement seems worthy of quoting at this point because it served as a basic guideline for a wide variety of Association actions. The paragraph reads:

> The National Science Teachers Association asserts its position that no single program can or should be designed for use in all or even a majority of the school districts of the nation. The Association believes in multiple efforts in curriculum development and will encourage and assist efforts involving creative and diverse approaches by many groups and agencies—local, regional, and national.

Because of this firm belief, the Association made no attempt to design and seek funding for any massive curriculum development project of its own; it did not propose "the NSTA curriculum" in competition with the NSF-sponsored projects or the offerings of commercial publishing houses. On the contrary, NSTA provided editorial space in its journals and platform time and space in the programs, exhibits, and curriculum centers of its conventions for the presentation and discussion of these diverse offerings. The Association believed in the ventilation of all such proposals and in the free exchange of pro and con debate, always hopeful, of course, that the criteria and guidelines issued by the Association would be helpful to teachers and others involved in decision-making processes.

NSTA Help Toward the Improvement of Instruction

The journals of the National Science Teachers Association have been the most consistently published, dynamic, informative, and useful components of NSTA's "voice for science teachers." Currently, the three journals have a combined circulation of approximately 50,000 copies, comprised of *The Science Teacher*, 24,000; *Science and Children*, 23,000; and *Journal of College Science Teaching*, 3,500; hence they are undoubtedly the most

widely read and the most impactful of all NSTA publications. Moreover, since they are aimed primarily at classroom teachers, the impact is greatest where it counts the most — in the crucible of the classroom where the teacher-learner interactions that we call science education take place.

Operating within the broad purposes and policies of the Association, each journal is produced by its own editor and other professional staff located in the Headquarters office. Guidelines and criteria for the content of each journal and other forms of assistance are provided by editorial advisory boards comprised of representative appointees from the membership and readership appropriate for each journal.

Although the journals cover the full spectrum of concerns about science education, the principal focus and the bulk of editorial content in all three have related to curriculum, instruction, and instructional support systems and materials. This fact is evident in the titles of standing columns, features, and service sections which appear regularly in one or another of the journals, some examples of which are (or have been):

Journal of College Science Teaching (launched in 1971) — How I Do It; Innovations (in Curriculum and Instruction); Equipment and New Products; Abstracts; Instructional Media; and Books (reviews)

Science and Children (launched in 1963) — Science and Teachers; Ad-vailables (materials, publications, events); Individualized Science (reviews); Phenomena For Inquiry; Resources Reviews

The Science Teacher (purchased by NSTA in 1950) — With the Schools; Classroom Ideas; Resources Reviews; Spotlight on Research; Rebuilding the Science Program; From Research (in science) to Classroom-Laboratory Teaching

Periodically, selected articles from three to five years' issues of *The Science Teacher* and *Science and Children* have been collated, reprinted, and released as separate NSTA publications. Examples are *Teaching Tips From* The Science Teacher-*Physical Science* and companion volumes for *Earth-Space Science* and *Biological Science; Environment–the Human Impact* (66 articles from *The Science Teacher*); *Helping Children Learn Science* and *Helping Children Learn Earth-Space Science* (each containing approximately 50 selections from *Science and Children*). These reprint volumes helped latecomer members and other readers skim off some of the cream of earlier years, and the record shows that sales of such publications ranged from five to ten thousand copies each.

The Association's first experience in launching a new periodical actually began in 1952 when the Board approved a proposal from the Committee on Elementary Science to publish the *Elementary School Science Bulletin (ESSB)*. The Committee took responsibility to prepare four issues a year, and copies were sent to all Elementary Members and Subscribers without additional charge. ESSB flourished, attracted additional subscribers at the modest rate of $1 per year, and quickly grew to be a task demanding more time than the Elementary Science Committee could give to it. Dorothy Alfke, Professor of Elementary Science Education at The Pennsylvania State University, was engaged as part-time editor of ESSB. Her task was to prepare issues (now six times a year) from the raw materials supplied by the Committee and a growing number of volunteer contributors plus, of course, material which she generated herself. She forwarded the manuscript materials to the NSTA office for publication. Very soon, however, *ESSB* outgrew the capabilities of this arrangement and editorial responsibility as well as production was brought into the Headquarters office. *ESSB* ultimately reached eight issues per year, and circulation increased to more than 20,000 copies per issue — a resounding success by our standards and expectations. It was this success that in a sense went to our heads and prompted the initiation of *Science and Children* 10 years after the birth of *ESSB*. The foundations were firm, the clientele was on board, operational procedures had been developed, and *S and C* emerged as even more successful than ESSB.

Additional details concerning the three Association journals must be recounted here because of certain policies and principles of operation established by the Boards of Directors. When the purchase of *The Science Teacher* was being negotiated in 1950, the Board promptly decided that editorial responsibility for the journal should be a function of the Headquarters staff. As is well known, the journals of some professional societies — e.g., *The American Biology Teacher, The Journal of Chemical Education,* and *Social Education* — are edited by persons located at colleges or elsewhere, hundreds of miles away from the respective headquarters offices. In some cases the editor feeds selected, edited copy to the office staff for production; in some cases the editor works directly with the printer and the headquarters is completely bypassed. The 1949-50 Board of Directors quickly decided, however, that NSTA should house and coordinate the editorial, production, advertising, and circulation

function under one roof — at Headquarters. Also, it was decided that the tasks of Editor of *TST* should be added to the job description of the Executive Secretary and that an Advisory Editorial Board should be established to oversee the entire magazine operation.

Within a year, this arrangement produced at least a few questions that had to be resolved, the principal one being who had control of and final say on the selection of editorial content — the Editor or the Advisory Board. Obviously, there were some proponents of the belief that at least all *TST* articles should be approved by the Advisory Editorial Board. As the Editor, I strongly opposed this view, pointing to the split decisions, delays, and possible bickering that almost surely would result. I argued for the use of reviewers and consultants to assist in manuscript reviewing, but insisted on one-person decisions by the Editor on final selection. "And if the Editorial Advisory Board and the Board of Directors at the end of a year believe that the selections show poor judgment, have been biased toward a personal point of view, have run counter to established policies, or can be substantiated as deficient in other respects, then you dismiss the incumbent and get a new Editor" was the position I took. The 1951 Board of Directors debated the issue and by an overwhelming vote supported the Editor's position. When *Science and Children* was launched in 1963 and the *Journal of College Science Teaching* was launched in 1971, these operating principles and the respective roles of Editor, Editorial Advisory Board, and Consultants had become firmly established; they were adopted without question for the new journals.

Because of the key role that the three journals have played in Association communications and as the central component of NSTA efforts to develop "a voice for science teachers and the profession," the Editors of the journals have carried a heavy responsibility — and we were extremely fortunate in the persons who occupied these positions.

When *S and C* was on the launching pad, Frank Salamon had been on the staff for about a year as Specialist for Elementary Science, and Phyllis Marcuccio had been with us about the same length of time as Staff Assistant to the Editor of *TST*. Almost as a bolt from the blue, these two suddenly became Editor and Editorial Assistant for *S and C*. Starting with truly blank pages, no traditions to follow (or discard), and a success-or-failure challenge staring them in the eye, *S and C* became instant success. Subscribers, elementary members, and adver-

tisers, responded quickly in growing numbers. Invited and voluntary contributors submitted manuscripts of high quality in ample amount. Only that first year of publication was needed to convince any skeptic that the decision to launch *S and C* was a wise one and that the Association had followed through in a thoroughly capable manner. Phyllis became the Editor of *S and C* in 1965 when Salamon resigned to join a commercial publishing firm. In the issues since then to this day, she has repeatedly demonstrated editorial capabilities, artistic and creative approaches, and good "PR relations" with constituents and cooperators in guiding this journal to a circulation of more than 23,000. *Science and Children* has been recognized with perhaps a dozen awards for excellence by the Educational Press Association and other groups.

The record of the *Journal of College Science Teaching* closely parallels that of *S and C*. When the decision to launch was made by the 1970 Board of Directors, we invited Leo Schubert to become the Editor. Located only six miles from NSTA Headquarters as Professor and Head of Chemistry at American University, Leo had long been involved in both science teaching improvement projects and NSTA activities. He was close enough geographically to be truly a member of the Headquarters staff, even though part-time. We employed an assistant under the title of Managing Editor to work with him and to handle all of the tasks of production. Now in its fourth year of publication, *JCST* has approached the 4,000 mark in circulation, is issued five times a year, and has become a prestigious journal much sought after as a publication outlet by college professors of science — all under the guidance of Editor Schubert, who took the job in the first place "for a year or two" to help launch the new project.

Back to *TST*, I handled the duties of Editor with the help of an assistant (titled Managing Editor) during 1950-58. Meanwhile the tasks landing on my desk were multiplying rapidly, along with growth in conventions and regional conferences. Beginning with the September 1958 issue, Frances J. Laner was on board as Associate Editor of *TST* but with 98 percent responsibility for that journal. She quickly injected new zip into the operations, and in 1960 gave *TST* a new, more functional design and format that promptly caught on, both with readers and with advertisers. This format is the one still used for *TST* today. When Laner resigned in June 1963, Mary E. Hawkins joined our staff with recognized, full responsibility as Editor of *TST*. During the 11 years since, she has guided this journal to new heights of

excellence, professionalism, and functional service to members and the profession at large. As with *S and C, TST* has been recognized and honored through numerous awards and citations by the educational press fraternity.

In the case of Hawkins, not only did she take on *The Science Teacher* but soon also became Director of Publications. This meant that with one Editorial Assistant, she supervised and managed the rapidly growing program of miscellaneous publications generated through the stimulation of J. Darrell Barnard and the productivity of the Katherine Hill Publications Committees of the mid- to late-1960s.

The *NSTA News-Bulletin* rounds out NSTA's periodicals for teachers. Starting as a modest newsletter type insert in the issues of the Packet Service, *NNB* has been issued three times a year for Association members only. The content of *NNB* is almost 100 percent just what the name implies — in-house information about Association activities, events, and members.

The most popular series of NSTA publications related to instruction has been the so-called "How to" bulletins. Initiated in 1965 as a series of instructional aids for elementary and secondary teachers, approximately thirty titles have been produced to date and twenty of these are still in print and for sale by the Association. Printing runs and sales have ranged from 5,000 to 20,000 copies for various bulletins. Illustrative of the nature and scope of the series, here are some of the titles: *How to Record and Use Data in Elementary School Science; How to Use an Oscilloscope; How to Use Behavioral Objectives in Science Instruction; How to Provide for Safety in the Science Laboratory; How to Utilize the Services of a Science Consultant; How to Teach Measurement in the Elementary School; How to Care for Living Things in the Science Classroom; How to Read the Natural Landscape in Forests and Fields.* These bulletins were not only a service to members and to the profession; they also provided a publishing medium for authors with unusual experience, competence, and expertise in the topical areas covered.

The first publications put out by the Association to provide instructional aid were seven volumes in a series under the general title, *Science Teaching Today* (1950-51). The specific titles were: *Experiments with Water; Experiments with Air; Experiences with Fuels and Fire; Experiences with Heat;Experiences with Magnetism and Electricity; Experiences with Sound;* and *Experiences with Light and Color.* Designed for use in the upper elementary and junior high grades, the books provided about 200 ideas and

procedures for teacher demonstrations, pupil laboratory exercises, and individual projects. While not very sophisticated — the materials were all in the spirit of teaching with "soda straws, milk cartons, and household, hardware store, and ten-cent store" equipment — the books nevertheless helped thousands of teachers get going in elementary science and to go beyond textbook, talk, and chalk in junior high school science. Over 100,000 copies were sold before the series was abandoned in the early 60s. The materials had been prepared by Guy V. Bruce (Newark, New Jersey, State College). Eager to move NSTA into the publishing business, I persuaded Bruce to give his manuscripts to us for publication rather than to a commercial publisher. We worked out a contract providing for annual royalty payments to Bruce. Later, however, an operating policy was adopted precluding any future NSTA-author agreements entailing the payment of royalties. This policy is still operative; authors make their manuscripts available as non-compensated, professional contributions or, in some cases, for one-time payments of fixed honoraria. There have never been payments to authors of articles, editors of columns or features, or writers of reviews appearing in the three journals of the Association.

External funding has enabled the Association to develop, publish, and market one series of six titles and several single-volume issues for assisting with the strengthening of instruction in specific areas. Under a grant of $19,000 from the National Aeronautics and Space Administration (NASA) (1964), a team of six authors, a general editor, and staff aides produced the series *Investigating Science With Children,* aimed mainly at grades K-6. The six titles were: *Living Things; The Earth; Atoms and Molecules; Energy in Waves; Motion;* and *Space.* Ruth Roche, San Fernando Valley State College, Northridge, California, served as series editor, with Frank Salamon as the NSTA staff editor. Authors were Arthur Costa, Sacramento County, California, Public Schools; Louis T. Cox, Jr., Towson, Maryland, State College; Lois E. Dunn, Jefferson County, Colorado, Public Schools; Lawrence Hubbell, Oak Park, Illinois, Public Schools; Seymour Trieger, Temple University, Philadelphia, Pennsylvania; and James R. Wailes, University of Colorado, Boulder. The NASA grant provided for manuscript production only. In this case we negotiated with Teachers' Publishing Corporation to publish, advertise, and market the books with a provision for the payment of royalties to NSTA — a contract acceptable both to NASA and to the NSTA Board of Directors. However, we were so much

in debt to the publisher for the costs of editorial service and illustrations that our royalties were eaten up before the books ever reached the press. More than 60,000 copies of the books were sold, and we didn't *lose* a dollar, either; and so it could be said, "mission and purpose accomplished."

Another NASA grant led to an instructional aid that was developed by procedures essentially a staff operation. Associate Executive Secretary Albert F. Eiss prepared the proposal and carried the project to completion. He assembled a team of junior high school science teachers, located mostly in West Virginia, and met with them at monthly intervals over a six-months period. In the early sessions the teachers tried to "think up" activities, demonstrations, or whatever that they felt could be effective in helping students learn about contemporary explorations of space. In between sessions the teachers developed the ideas, designed and constructed essential hardware, and tried out the activities with their students. In later sessions the try-out results were discussed, revisions were developed, and write-ups for publication were prepared. Eiss applied the final editing, and the end product of the project was published under the title *A Universe to Explore* (1969).

The largest grant ever received by the Association (1960-61) for the production of instructional materials came from the International Business Machines Corporation, a total of about $130,000. Known as the Project on Information Processing (PIP), the money was used for the preparation, publication, and partial distribution of three booklets dealing with computers. The first of these, *Careers in Electronic Data Processing*, was distributed free of charge to approximately 100,000 members of NSTA and other science teachers listed in our Registry. The other two booklets were issued as low-cost sales items; they were *Computers–Theory and Uses (Student Manual)* and *Computers–Theory and Uses (Teacher's Guide)*. Combined sales of the two amounted to approximately 50,000 copies. Interestingly, this project was referred to NSTA by one of our members, Hugh Allen of Montclair (New Jersey) State College, who, through acquaintances and friendships, learned of IBM interest to sponsor such an endeavor. Allen served as general director of PIP, and the budget enabled us to employ half time a graduate student at New York University, Vincent Darnowski, as researcher-writer for one academic year to prepare the manuscript materials. J. Darrell Barnard (President 1961-62 and also located at NYU) and a

group of cooperating teachers in the metropolitan area assisted in reviewing the materials prior to publication.

Some outputs of instructional aids derived from on-going Association activities other than projects or writing assignments specifically for this purpose. Reprints of selected journal articles, the publication of prize-winning submissions in the STAR and OHAUS programs of teacher awards, and the publication of both student and teacher materials from Future Scientists of America programs are examples.

The Association has been active also in the medium of the motion picture. The first venture of this kind was launched in 1950, and the fourth major excursion into the realm of the film began in 1972.

In 1951-52 the Association accepted an invitation from Teaching Film Custodians (TFC) to appoint a committee that would review selected Hollywood films and from certain chosen ones prepare excerpts for use in science classroom teaching. TFC was a non-profit corporation that carried on this work in collaboration with the Motion Picture Association of America, on the one hand, and, on the other, with NSTA and similar professional organizations in the fields of the social studies, health, home economics, and music. The excerpts that were accepted by the committee were further edited and polished by TFC, bridging or transitional sequences (perhaps titles) were inserted at the suggestion of the committee, and teachers guides were prepared, these also incorporating suggestions of the committee and subject to its final approval. The excerpted films were unique in that all of them dealt only with science teaching objectives in the affective domain. The committee promptly ruled out the production of films that would be essentially purveyors of information in favor of concentrating on ones that dealt with methods of scientific inquiry and invention, the social effects of scientific/technological advances, the clash of different values systems, differences in cultural beliefs and practices, and the like. The project continued until 1967. In all, NSTA Film Excerpt Committees produced about 35 teaching films during this 15-year period.

In 1960, the Association was awarded a grant by the National Cancer Institute (NCI) which, together with later supplemental grants, enabled us to carry out a $140,000 project resulting in the production of six career guidance and motivational films for use at junior and senior high school levels. The project concept and proposal were developed by John W. Renner (As-

sociate Executive Secretary, 1959-63) who, along with Herbert A. Smith (President, 1958-59), served as a co-director of the project. A research inquiry of about 100 junior high school science teachers and nearly 10,000 of their students was conducted as a preliminary to and a basis for the actual film production phase. Both of these tasks — the research and the production of the films — were subcontracted to appropriate units of the University of Oklahoma. An advisory committee headed by Smith frequently reviewed proposed scripts and preliminary footage and offered suggestions. The finished films were marketed for NSTA by a commercial organization under a royalty arrangement, and they continued in circulation for about eight years.

Came 1971, NSTA again entered into a film-making project. This time it was in cooperation with Allegro Film Productions, Inc. (New York City) through the medium of an advisory committee to review preliminary guides for final versions of the films. The project consisted of preparing nine monthly film releases during the school year, each one a 13- to 15-minute presentation of three or four news-type reports of frontier research and recent advances in science, engineering, and technology. Under the series title, *Science Screen Report*, the films were offered free of charge to schools or school systems through the cooperation of business-industry sponsors — a local bank or company, a community division of a national corporation, and so on, who purchased the films from Allegro and donated them to the schools. NSTA received a modest royalty on sales sufficient to cover the overhead on involvement.

The film adventure of NSTA continued in cooperation with the National Science Foundation, starting in 1972 (no grant or contractual funding by NSF involved). In announcing the first five titles in a series of mini-documentaries, the salient features of the films were outlined as follows.

> Each film was a star feature of a recent television series (produced by NSF as part of a program to promote public understanding of science) on the world of scientists and topics of current interest and concern ... these 6- to 8-minute films are now available for classroom use, for individual student work, for assembly programs, for science club events, or for other educational uses. They are short enough to be seen, discussed, and rerun in a class period. Each might be the basis of a minicourse ... Included with each film is *Science Selections*, a collection of digest-type accounts of on going scientific research.

The films were made available by NSTA on a rental basis or copies could be purchased outright. The project was short-lived,

however; the response was meager, and the offering was terminated in 1974. (But the films were really excellent!)

NSTA in Support of Science Teachers and the Profession

In addition to its contributions to science curriculum development and to the improvement of instruction, the National Science Teachers Association made many conscious, planned efforts to help enhance the status and self-image of the science teacher and to encourage continuing professional growth. The Association sought in many ways to help improve the conditions and facilities that are so vital to teacher morale and effectiveness. The Association on several occasions went to bat for legislative action and enlightened public awareness considered important in supporting better science education for all children and youth.

The Association was still in swaddling clothes when its voice was first heard in support of proposed legislation. As World War II was drawing to a close and the importance of good science teaching in the schools was gaining recognition, several legislative proposals were introduced in the U.S. Congress designed to provide federal support for the improvement of high school science education. Letters of support for the general idea and one bill in particular were sent by NSTA to appropriate members of the House and Senate. The NEA also supported the proposed legislation. This was in 1945. Actually, of course, federal support for science and mathematics did not become reality until the days of the National Science Foundation (1951) and the National Defense Education Act (1958).

The concept of a National Science Board and a federal agency under it to carry on activities in support of scientific research *and teaching* seems to have appeared first in the famous Bush Report, *Science–the Endless Frontier,* and the subreport by Steelman titled *Manpower For Research* (both 1947). It might be said that NSTA had at least the tip of a little finger in this pie, in that Ralph Lefler (President 1950-51) was a coauthor of sections of the reports having to do with science teaching in the schools, precollege. The Association supported the proposal for a National Science Board by resolution of the Board of Directors and appropriate follow-up letters. Legislation establishing such an agency passed the Congress, and President Truman appointed

the first National Science Board in 1950. NSTA immediately voiced criticism of the fact that on the Board there was no representation from precollege science education, and one year later the Association chided Congress for meager financial support of the new agency. Representing the "feelings" of NSTA officers, these criticisms appeared as editorials in *The Science Teacher*, as follows.

Foundation of the Foundation

A National Science Foundation is now public policy in the United States. The first National Science Board has been appointed. Pre-college science education, as such, is *not* represented among the Board's membership. This, we think, is regrettable. On the other hand, several members of the Board are well informed on the problems and present status of science teaching in our secondary and elementary schools. And this, we think, is good.

If the purposes of the NSF are to be realized fully in the years ahead, we must not lose sight of the fact that the scientists of tomorrow are in the nation's elementary and secondary schools of today. Moreover, in our schools today are the *citizens* of tomorrow — the men and women whose attitudes and beliefs will largely determine the conditions under which scientists will work, and whose votes may decide whether a National Science Foundation is to be continued.

We cannot afford to de-emphasize or neglect science instruction at the earlier educational levels today and simply *hope* that we'll have a scientifically literate citizenry and a revealed wealth of science talent ten years or more hence.

Confident that the Board is cognizant of the situation, it is our hope that effective lines of communication will promptly be established between the NSF and all pre-college science education. Further, it is our suggestion that possibly the most appropriate liaison group is the AAAS Cooperative Committee on the Teaching of Science and Mathematics. In any such cooperative endeavor NSTA may be counted upon for enthusiasm and full support.

— *The Science Teacher*, February 1951, p. 11.

NSF—In Business or Out?

When the National Science Foundation was established last year the Congress set a ceiling of 15 million dollars on its annual authorization. In developing this year's request for 14 million, NSF under the direction of Dr. Alan T. Waterman had proposed eight million to support basic research and five million for 2100 graduate fellowships.

In late August the House Appropriations Committee cut the NSF request from 14 million to $300,000. As of this writing the House has approved the committee's recommendation. Obviously such a reduction, should it stand, would be tantamount to putting NSF out of business.

In one of its Public Service advertisements, International Latex Corporation calls the House Appropriations Committee action "the 'Believe It or Not' Congressional error of a generation." Certainly one cannot help but wonder how well some of our leaders understand the nature of the scientific enterprise and the role of scientists in our modern industrial society.

Robert H. Carleton

— *The Science Teacher*, October 1951, p. 183.

Jump over a span of 20 years and we find NSTA again going to bat for NSF appropriations. On March 2, 1972, Morris R. Lerner (President 1971-72) appeared before the House Committee on Science and Astronautics, Sub-Committee on Science, Research, and Development, and urged the Committee to increase substantially the NSF budget for precollege science education for fiscal 1972-73. He read a paper to the Committee which, in part, said:

> This document is a position statement, together with recommendations, from the National Science Teachers Association ... the result of noting with great concern ... a serious, threatening decrease in support for (precollege) educational programs over the past two years, coupled with our firm belief that more and better science education ... is an imperative for all children and youth in these days of growing concern about societal problems and national needs. ... The budget for precollege education in science in 1970 was $53.7 million and in 1972, $35.2 million. ... The very advance of science which NSF helped foster has resulted in a society rooted in technology. ... To meet the changing needs of society, science education should be consistently supported at a substantial level. ... We must increase the opportunities for strengthening science instruction for *all* pupils — in elementary grades, middle schools, junior high schools, and for the 60 to 70 percent of high school students who currently take no science courses beyond tenth grade ... we believe that support should be provided for schools, school systems, supervisors, and teachers to work collaboratively on *their* problems, problems identified from within and among the schools ... we must pay more attention to what schools and teachers want ... the National Science Teachers Association strongly recommends that ... the educational budget for FY 1973 should be higher than it was for 1970.[1]

The Association went on record several other times in support of proposed legislative action at the federal level, sometimes in reference to specific bills and sometimes primarily to supply data and present the Association stance on issues under consideration. Presidents Glenn O. Blough (1957-58) and Herbert A. Smith (1958-59) appeared in person before committees of the Senate and/or House during the evolution of the National Defense Education Act of 1958. More often than not, however, NSTA testimony was submitted in the form of prepared statements, about 40 copies of which would be hand delivered to the office of the chairman of the appropriate Senate or House committee, or both. Presumably the information and viewpoints we provided would be considered by the committee staff and thus have some influence on legislative proposals and bills. Always we were assured that our submissions would be "entered in the record," that is, printed in *The Congressional Record*.

[1]*The Science Teacher*, May 1972, pp. 75-76.

The Association tried to help teachers, schools, and school systems derive maximum benefits from the National Defense Education Act of 1958 by preparing a booklet titled *Action for Science Under NDEA*. A $7500 grant from the Laboratory Equipment Section of SAMA enabled NSTA to prepare and publish the booklet and distribute approximately one hundred thousand copies to members and to science teachers listed in the U.S. Registry. President Smith (1958-59) spearheaded this production effort and also represented NSTA in a national conference on NDEA called by the Council of Chief State School Officers.

The Association has always stood for U.S. adoption of the metric system. This position was one of the planks in the *Platform For Action* put out by NSTA in 1944. Supportive resolutions favoring metrication were adopted frequently by Boards of Directors through subsequent years, and these were usually communicated to appropriate legislative committees. Peak activity on the metrication issue occurred during 1970-71 when the Association was invited by the U.S. National Bureau of Standards to prepare a working paper for and later participate in a national conference on the subject as part of a Congressionally authorized study of the impact and implications of metrication on all aspects of national life (for excerpts from the NSTA *ad hoc* committee's report, see *The Science Teacher*, January 1971, p. 6). The Association followed up on the report by promptly developing some publications and three issues of the Elementary Science Packets specifically for helping teachers with instruction on metrication.

Turning to science teachers themselves and their quest for status, recognition, and the tools and conditions essential for effective work, it can be said without equivocation that NSTA from the outset has pursued this goal as a high priority purpose. In 1948 the Association published *Teaching Conditions and the Work Week of the Science Teacher*, the report of a year-long study by a special committee. The study began as an inquiry confined to the state of New York under a grant of $750 from the General Electric Company jointly to the Science Teachers Association of New York State (STANYS) and NSTA. Soon, however, the study committee agreed that the inquiry should be expanded to give national coverage. NSTA allocated another $750 from its own resources to enable the project to go forward. The findings were pretty bad in regard to the numbers of preparations reported by teachers, the lack of laboratory

facilities, and the numbers of hours put into the job in classroom, laboratory, "extracurricular" assignments, and doing paper work after school hours at home. The committee called for certain optimum conditions of teaching assignments and physical facilities. About 12,000 copies of the report were distributed to public school system superintendents throughout the country, a target group whom the Association felt needed to be enlightened and educated.

The work week study was a considerable stimulus for Association activity on behalf of better science teaching facilities. No publication, standards, or recommendations in this area had appeared in nearly twenty years when NSTA in 1951 launched a special study under $4500 in grants from the Scientific Apparatus Makers Association (SAMA) and the Hamilton Manufacturing Company. The project and the grants were developed by then President Lefler and Past President Johnson, the latter serving as chairman of the special committee. The U.S. Office of Education joined the study as a cooperating agency and was represented on the special committee by Johnson, who by now had left Cornell University to become Specialist for Science in USOE. The committee report and recommendations were published in 1954 as *School Facilities for Science Instruction*, which went through three printings and one revision during the next 10 years; total sales were about 7,000 copies, mostly to school systems, school science departments, and school architects. Phil has said that of all his many and varied activities for science teaching through NSTA, he regards this facilities study as most significant.

In 1960 the Laboratory Equipment Section of SAMA again provided a grant (approximately $20,000) in support of an NSTA research-type study and report culminating in the publication, *Science Facilities for Our Schools K-12*. Under the guidance of a special committee, the project director, Fred R. Schlessinger (on one-third released time from The Ohio State University), carried on a series of conferences, interviews, and school visits and observations, circulated a questionnaire and analyzed the returns, and made a study of pertinent literature in laying the groundwork for the report. The report enunciated 20 general principles for planning facilities, included separate sections on facilities for elementary school and junior high school science, dealt with a variety of needs and problems at the senior high level, and closed with summarizing conclusions, recommendations, and implications. In addition to the circulation

of 25,000 copies of the report as an insert in *The Science Teacher*, December 1963, pp. 41-72, another 5,000 were purchased on single or small-quantity orders.

Still another approach and a new focus were brought to the question of secondary school science facilities through a study begun in 1970 under a grant of about $90,000 from the National Science Foundation. This was to be a search for exemplary facilities that were designed to serve specific curricular instructional, organizational, and administrative purposes. Project director Joseph D. Novak of Cornell University, assisted by a team of six co-investigators, reviewed more than 1100 nominations of exemplary facilities submitted by teachers, supervisors, curriculum project directors, and other types of nominators. Nearly 400 of these were sifted out for a probing inquiry by questionnaire, report forms to be filled out, and photographs as appropriate for study by the team. Approximately 130 schools were chosen to be visited in person by one member or another of the study team. Selections were based on the criterion that the facility or feature seemed truly exemplary *for a specific purpose*, and, further, that the specific purpose seemed contributory to the advancement of individualized instruction and allowed for flexibility. Some of the objects of visitation could be observed, discussed, and photographed within an hour or two. In some instances the school visit extended into a third day. Extensive notes, many tape recordings of interviews, and numerous photographs were used to summarize the visits. Novak and a graduate student as full-time assistant and writer prepared and edited the report of the study. The report was in two parts. First was a filmstrip and cassette-tape that presented highlights of the study under the title, *Evolving Patterns for School Science Facilities* (released in 1972). The printed report, *Facilities for Secondary School Science Teaching*, was published in 1973 as a 140-page book replete with pictures, diagrams, and descriptions for formulating plans for new and remodeled facilities.

Association concern for the conditions under which science teachers work was made manifest in the 1948 publication, *Teaching Conditions and the Work Week of the Science Teacher*. Under a Commission on Professional Standards and Practices, headed by F. James Rutherford (President 1974-75), desirable educational environments and recommendations were again set forth in *Conditions for Good Science Teaching* published 1970). This same commission also produced a document called *Annual Self Inventory for Science Teachers (ASIST)*. The pur-

pose behind this effort was to delineate — after careful study and consultation — a forward-looking set of standards that could stand as the profession's own statement of what it means to be a *professional* science teacher. The *ASIST* document took the form of a series of statements to be self-checked according to a 4 to 0 rating scale to reveal to the teacher (a) which standards had been met and in what ways, and (b) which standards had not been met and what was intended to be done about such deficiencies in the immediate future. *ASIST* was distributed as a pull-out insert in *The Science Teacher,* December 1970, pp. 37-44 (25,000 copies), and *Conditions* was listed as a sales publication (about 10,000 copies sold in four years). International impact was added when a request from the Australian Science Teachers Association to adapt and publish *ASIST* in a "down under" version for local use was approved.

The Association made a number of efforts to help improve the climate for science education by promoting knowledge and better understanding of science teaching on the part of parents and the general public. Perhaps the first effort of this kind was the publication in 1963 of the booklet, *You and Your Child and Science,* aimed at the parents of elementary school pupils. Written by Glenn O. Blough (President 1957-58), this publication was a joint venture of NSTA and the Department of Elementary-School Principals (NEA). It circulated widely among the membership of both organizations and was promoted through the National Congress of Parents and Teachers. Approximately 50,000 copies were sold. In 1967 a small pamphlet titled *Why Science In Our Schools?* was made available to NSTA members free or at low cost in quantity lots for distribution to school patrons during American Education Week, sponsored annually by NEA, USOE, and the American Association of School Administrators. Released originally by President Addison E. Lee as a message from the president of NSTA, the pamphlet was revised and re-issued by each of his next two successors (Shamos and Simendinger). In all, approximately 200,000 copies of *Why Science?* went into circulation.

The climax activity in behalf of public understanding of school science teaching was, in the opinion of many thoughtful persons, the development and publication of *Guidelines for Self-Assessment of Secondary-School Science Programs,* completed during 1972-74. As stated in the Preface, "This document is intended to offer ideas, guidelines, and a physical means for appropriate, concerned persons (teachers, students, parents,

and "concerned citizens") to do a searching, comprehensive examination of science teaching in their own secondary school ... (those) interested to know *why* there is a science program in the school, *what* it consists of, how well the science program is *supported*, and how well things are going ... this document invites and encourages a self-examination aimed at finding answers to two general questions: (1) What do we want the science program *in our school* to be and to accomplish? and (2) How well are we doing as measured against the hopes, desires, expectations for science *in our school*?" *Guidelines* drew heavily on earlier position statements and publications of the Association; notably, *School Science Education for the 70's; ASIST; Conditions for Good Science Teaching;* and *Facilities for Secondary School Science Teaching*. Hence, the Preface claimed, "This volume is the culmination of five years of thinking by NSTA about the science curriculum, the staff, facilities, and other elements that help determine the quality of a secondary school's science program."

There were four modules in the final, complete package; namely, Our School's Science Curriculum; Our School's Science Teachers; Science Student/Teacher Interactions in Our School; and Facilities and Conditions for Science Teaching in Our School. Within each module, 50 to 60 or more "statements of beliefs" were to be rated — first in terms of Desirability and then in terms of Achievement — on a scale ranging from 4 (highly desirable; high level of achievement) to −1 (undesirable; avoided or counteracted). Schools that completed at least three of the self-assessment modules and submitted reports to NSTA voluntarily were "rewarded" with a Certificate of Participation. Codirected by Richard J. Merrill (President, 1970-71) and Burton E. Voss (University of Michigan) and aided by five additional task force members, the project required a budget of approximately $30,000. The Fels Foundation contributed about 60 percent of this total; smaller contributions from five business-industry companies or corporations provided another 20 percent, and the Association itself put in the last 20 percent. The task force that developed the modules believed that the assessment exercise *if conducted with student and community involvement* would provide large pay-offs in identifying strengths and weaknesses in the school's science program, pointing the way toward improvements, strengthening teacher-school-community relations, and identifying criteria

and understandings for teacher-student-school-community accountability.

This chapter has reviewed a wide variety of Association endeavors aimed at supporting and assisting science teachers and advancing the profession in general. But twice in 30 years the Association went to the aid of individual teachers who were in legal difficulty. Both cases occurred during the period 1966-68 and both attracted NSTA participation on the basis of a specific, general objective; namely, to abolish restrictive state laws inhibiting the freedom of science teachers to present scientists' views of the origin of life.

In one of the cases, a science teacher in Tennessee was dismissed from his position for allegedly violating the state's code concerning the teaching of evolution in the public schools. The 1966-67 NSTA Committee on Issues under chairman Morris H. Shamos looked into the matter and prepared a resolution calling for NSTA to ascertain the full nature of the charges against the teacher and, assuming that the teaching of evolution was among these, to provide moral, technical, and financial aid in any defense effort. The Executive Committee approved the resolution, and NSTA entered the case as a party plaintiff — the only association to take such action. The NEA Commission on Professional Rights and Responsibilities had also entered the case, and financial aid for the teacher was provided by the NEA DuShane Fund for Teacher Rights (NSTA's contribution was $1,000 toward legal expenses). At the time, NSTA president Addison E. Lee said:

> Teachers have an obligation as well as the right to present the soundest, best-documented theories in all areas of science, including biology. In fact, the major aim of science teaching is to assist our young people to observe all aspects of the universe, its component parts, and its inhabitants, and to assemble their observations into a logical and trustworthy picture. Over the years, and the centuries, we have gathered our knowledge and have constantly formulated and modified our ideas about the development of living things. ... Society cannot tolerate any obstruction of the process of academic inquiry and the dissemination of information and ideas. These are not local matters. Science and education must be free to investigate, to think, and to evaluate. We cannot stand by without action when these rights are endangered.

In the words of its official complaint, the Association said:

> NSTA sues in its own behalf and on behalf of all its members, as well as those of its affiliates in the State of Tennessee, and its affiliates in all other states and all other science teachers, who seek to exercise freely the rights guaranteed by the First Amendment to the Constitution of the United States to the freedoms of religion, speech, press, assembly, association, thought, and belief, and academic inquiry and study.

The case never got to court. Perhaps fearing a second "monkey trial," the Tennessee legislature quickly repealed the restrictive statute, the same one which had precipitated the famous Scopes trial in 1925. The offending science teacher was fully reinstated, including back pay for the months dismissal was in force. Case closed; NSTA objective accomplished.

In the other, quite similar case, an Arkansas teacher in 1966 was charged with violating state law by teaching evolution. The teacher won a decision in the lower court, but on appeal by the prosecution to the Arkansas Supreme Court the constitutionality of that state's 1928 law forbidding the teaching of evolution in the public schools was upheld. As the case was carried to the U.S. Supreme Court, NSTA and NEA jointly submitted a legal brief as *amici curiae* in a challenge to the power of a state to specify the curriculum in its public schools. Points made in the brief argued that:

> The student must have free access to all thoughts and ideas in order to insure development of a sound intellect and a democratic society. ... Free access to hear such commonly recognized academic and scholarly arguments as Darwin's Theory is a fundamental right provided for in the Constitution and substantiated by court precedent. ... The State of Arkansas, by making it illegal to include the teaching of evolution in science programs, has imposed a straitjacket upon the intellectual leaders of our community.

On November 12, 1968 the U.S. Supreme Court unanimously declared unconstitutional the Arkansas statute prohibiting the teaching of evolution in the public schools (and, in effect, killed a similar statute in Mississippi, the only remaining state with such restrictive law). Again, case closed; NSTA objective attained.

The special creation–evolution controversy in the United States is, however, worse than a cat with nine lives. Another flare-up during 1972, mostly in a few western states, produced some repressive edicts by school administrators and serious threats of state legislative actions. This time the thrust of the effort was not directed *against* the teaching of evolution but to require "equal time" in science textbooks and classrooms for the presentation of the special creation theory. NSTA was one of several societies to release a position statement on the issue. Authored principally by Past President Lerner and approved by the Board of Directors, the statement released by President Elaine Ledbetter read as follows:

NSTA Position on the Inclusion of Neoscience Theories in Science Instruction

Throughout his recorded history, man has been vitally concerned in finding out all that he can about his universe. He has explored it in many ways, raised questions about it, designed methods by which he could increase and organize his own knowledge, and developed systems to aid him in understanding and explaining his own origin and nature and his place in the universe. Among these systems are philosophy, religions, folklore, the arts, and science.

Science is the system of knowing about the universe through data collected by observation and controlled experimentation. As data are collected, theories are advanced to explain and account for what has been observed. The true test of a theory valid in science is threefold: (1) its ability *to explain* what has been observed; (2) its ability *to predict* what has not yet been observed; and (3) its ability *to be tested* by further experimentation and *to be modified* as required by the acquisition of new data.

The National Science Teachers Association upholds the right and recognizes the obligation of each individual to become informed about man's many endeavors, to understand and explain what each endeavor has contributed to mankind, and to draw his own conclusions in each area.

The National Science Teachers Association also recognizes its great obligation to that area of education dealing with science. Science education cannot treat, *as science*, those things not in the domain of science. It cannot deal with, *as science*, concepts that have been developed in other than scientific ways. Moreover, the National Science Teachers Association vigorously opposes all actions that would legislate, mandate, or coerce the inclusion in the corpus of science, including textbooks, of any theories that do not meet the threefold criteria given above.

In certain areas of special concern, NSTA deferred to one or another of its Sections or, at most, played a cooperative role. In 1967, *A Sourcebook for Science Supervisors* was published by NSTA for the National Science Supervisors Association (NSSA). Initiated by NSSA president Annie Sue Brown (Atlanta, Georgia) and edited by Mary Blatt Harbeck, the book included contributions of about twenty authors on various aspects of the people and problems dealt with by the science supervisor. The wind-up chapter consisted of a self-test for use in estimating a supervisor's own job performance. The book went through two printings (about 7500 copies), indicating without doubt that it was perused and probably found helpful by many more persons than just the practicing science supervisors.

The Association for the Education of Teachers in Science (AETS) developed two significant position statements setting forth recommended guidelines and standards for the profession within its domain of concern and activity. First to appear, in 1966, was *Guidelines for the Doctorate in Science Education*. Developed by a "blue ribbon" committee (as described by AETS president R. Will Burnett of the University of Illinois) under the

chairmanship of F. James Rutherford (Harvard University), the document was published in *The Science Teacher* (October 1966, pp. 32-35) and several hundred reprints were additionally distributed. Two years later (*The Science Teacher*, May 1968, pp. 85-90), AETS again came forth with a set of recommendations for the profession in the form of *Guidelines for the Content of Preservice Professional Education for Secondary School Science Teachers*. Whereas the doctorate guidelines had been "approved in principle" by the AAAS Cooperative Committee, the guidelines for the first-level preparation of teachers were developed jointly by a subcommittee of the two groups under the chairmanship of Wayne Taylor (Michigan State University), thus enhancing the "authority" behind the document. In the case of both these documents, and the supervisor's sourcebook as well, NSTA's role was to provide "the voice" or communications medium by acting as publisher of the material. An AETS commission to review and update the doctorate guidelines was nearing completion of its task as this period of NSTA history (1944-74) drew to a close; as before, the product of its efforts was scheduled for *The Science Teacher* publication later in 1974 or early 1975.

Aborted Efforts

Not all NSTA undertakings in behalf of supporting teachers and advancing the profession were as successful as those thus far described. Publications in particular were always a bit of a risk. No amount of planning by a Publications Committee could guarantee a "best seller." Practically all miscellaneous, topical publications, including the individual titles in the How-to series, were developed under the aegis of a committee. Comprised of representation from all levels, areas, and aspects of science education, the committee would propose and consider various subjects for publications, and then settle on certain ones to be developed within budget and time schedules. They suggested or even arranged for authorship in close collaboration with staff editorial and other professional personnel. This plan of operation was initiated by J. Darrell Barnard as President in 1961-62, but the idea was molded into functional format by a succession of committees under the three-year chairmanship of Katherine E. Hill (New York University) during 1965-67.

Most of the output of this kind of effort proved quite successful, but not all. Overall, however, our batting average on

publications was pretty good and not one failed at least to break even on cost of production, so no complaints.

Two of our large, grandiose ideas for broadscale action turned into large, grandiose failures. Both were cast in the form of commissions with, in retrospect, very generalized, nebulous task assignments from the Board of Directors.

At the 1956 annual business meeting, the Board of Directors approved the recommendation of incoming President John S. Richardson for the appointment of a 15-member Commission on Education in the Basic Sciences (CEBS). Expectations were that the Commission would "undertake major studies in curriculum, teacher education, and instructional procedures" in science education. Clearly, a very large order, but generalized, perhaps, to the point of frustration. However, this was just about the time that NSF was moving into high gear with its science curriculum projects and several million dollars in support money, and CEBS seemed like a timely, great idea. With hardly a dime to allocate to the new Commission beyond expenses of only two authorized meetings, the CEBS venture certainly was a bold, hopeful undertaking. Membership make-up of the Commission was announced in April 1957, and the first meeting of the group was held May 3-4 under the chairmanship of John S. Richardson. Loaded with talented, prestigious individuals, it took only this one meeting to reveal that that was precisely what we had unwittingly put together — a collection of hard-minded individuals with philosophic convictions and pragmatic approaches spread around all 360 degrees of the horizon. Not that this was bad, or unmanageable, or even undesirable; it was simply a case of immediate and utter frustration. The meeting accomplished almost nothing except to demonstrate that if the group was ever to evolve "a map of the domain of science education" and to lay out bold guidelines for education in the basic sciences, then carry out major studies as was projected — many meetings a year, a suitable CEBS staff, and several hundred thousand dollars would be required. Nevertheless, the basic idea of CEBS so appealed to Richardson that he persisted and attempted to meld the group into one of common purpose through the preparation and circulation of two or three working papers. But of no avail. One more meeting of the group, with 50 percent absenteeism, produced no substantial progress, and at the following annual business meeting (July 1959) the Board of Directors abolished CEBS.

A second big-idea project similar to CEBS was launched with July, 1964 approval of the Board of Directors. This time it was CETS — the Commission on the Education of Teachers of Science. In announcing CETS to the membership (*The Science Teacher*, October 1964, p. 5), it was said that "The Commission is a direct outcome of the work of the NSTA Curriculum Committee. With the development of the position paper (1962) ... it became apparent that the preparation of science teachers was a major problem to be considered." The Association for the Education of Teachers in Science and the NSTA Executive Committee promptly recommended a Commission to work on the problem, and the 1963 Board of Directors gave preliminary authorization. With Fletcher G. Watson of Harvard as chairman, a small task group drew up a working plan for a full-fledged Commission, including time schedule and a budget of approximately one-quarter million dollars. This proposal was submitted to a foundation as the basis for requested financial support. After nearly one year of no action by the foundation (a sort of pocket veto), the proposal was withdrawn. Then followed the 1964 Board action with the understanding that "the Commission be established and the program be carried out to the extent that funds are available." But the hard inescapable fact was that the Association had zero internal resources to allocate to the mountainous task it had just set for itself. The efforts for CETS quietly petered out, interim activities were revised, and in 1970 CETS was terminated.

But there were some positive results. About a dozen conferences for college science teachers were held under the auspices of CETS during 1965-70. These were planned and carried out largely through the personal efforts of Associate Executive Secretary Albert F. Eiss and Past President Herbert A. Smith (1958-59). The conferences produced several publications for college teachers. Perhaps more important they resulted in a roster of 5,000 keep-me-on-your-mailing-list college science teachers who by now had become aware of and involved in NSTA activities. This list proved exceedingly valuable when two years later the *Journal of College Science Teaching* was launched. More than 2,000 college teachers from this roster became charter subscribers to the new journal. The conference response and persistent interest of the college science teachers became a major factor in making the decision to launch such a journal.

This point in our narrative seems as appropriate a time as any for reporting on two undertakings similar in design and

purpose and intended to bring together in dialogue science teachers and the general public. One of these was moderately successful and the other — definitely zilch! The first took the form of a Silver Anniversary Year (SAY) Commission, while the second was a Commission to develop a nationwide program of Symposia on Science, Science Teaching, and the Quality of Living.

Under the general chairmanship of John S. Richardson, the SAY Commission planned three principal activities to coincide with or come to a head during NSTA's 25th year of existence, 1968-69. First was a Silver Year Review of Association history prepared by a subcommittee chaired by Brother Joseph D'Agostino FSC, Christian Brothers Educational Foundation, New York, New York. The report of this committee appeared as four special inserts in *The Science Teacher* (September, October, November, and December, 1968). A second subcommittee headed by David P. Butts (University of Texas, Austin) prepared a substantial publication that set forth ideas, proposals, and guidelines for the development of science teaching; it was titled *Designs for Progress in Science Education* and was published in 1969. Third among the three-pronged SAY observance was a program of Silver Year Symposia, planned by a subcommittee with Milton O. Pella (University of Wisconsin) as chairman. This was the one component of SAY that ran into some difficulties.

As conceived by the Silver Year Symposia committee, the general plan was to set two, three, or four symposia centers in each of the states (about 150 symposia in all), and for each of these to develop under a local chairman a one- or two-day program of speakers, panelists, or whatever was deemed appropriate for an audience of concerned citizens, scientists and engineers, school board and administrative personnel, rather mature students, and, of course, science teachers. Merely as a suggestion, the committee proposed that some variation of "Science and Society" be used as a theme for each symposium. There was to be a coordinator in each state who, in addition to spearheading the planning for the several symposia, would collect copies of all addresses, papers, panel discussion summaries, and the like and transmit these to NSTA headquarters for review, editing, and publication.

The question of budgets and how to meet local and state expenses emerged as a significant consideration. The Association had no funds to spare for such purpose and foundation

grants were unobtainable. Without expense money, only about 30 brave and resourceful souls carried through with local symposia. Attendance at these ranged from 30 to 100 persons upward to more than 300 in a few instances. However, several outstanding scientists participated in the symposia as speakers and their prepared papers were unusually informative and provocative. In fact, Charles Scribner's Sons, the commercial publishing house, made a selection of these essays and published them as a general trade book under the title *Science Looks at Itself* (1970).

By the time of the early 1970's, concern for the environment and the "quality of life" had become a nationwide issue and the basis for numerous diverse actions by equally diverse groups, agencies, and organizations. NSTA was not about to be caught standing by, ignoring the problems, doing nothing. And much was done — special publications, theme issues of the journals, special sessions and workshops at conventions and other meetings, and ultimately affiliation with the Alliance for Environmental Education. The capstone of NSTA endeavors was to be a Commission on Science, Science Teaching, and the Quality of Living and nationwide symposia similar to the SAY symposia. The Commission was co-chaired by Robert C. Howe (The Ohio State University and Archie L. Lacey (Herbert Lehman College, New York, New York). The six additional members represented six geographical clusters of six to ten states each. The appropriate commissioner was to work with state coordinators within each cluster to plan an average of four symposia per state, all to take place within a specified two- or three-week time period for maximum publicity and impact. There was real hope of obtaining an adequate grant from the U.S. Office of Education to help support the symposia and that the Educational Research Information Center (ERIC) would support a data-gathering survey as a base for the symposia programs. After many delays, these grants finally failed to materialize, and the entire symposia plan had to be dropped.

The Showcase Voice of NSTA

As NSTA concluded its first national convention in Pittsburgh in March 1953, one of our officers observed, "NSTA has just turned the biggest corner of its life." How accurate and prophetic that proved to be! From that modest beginning with

620 registrants, about 30 commercial exhibits, and two and a half days of activities the national convention by 1966 grew to ten times those numbers of registrants and exhibits, duration stretched to four to five days, and, perhaps of greatest significance, over 500 participants (speakers, panelists, workshop leaders, committee personnel) were involved in planning and conducting each convention. The budget for the national convention alone reached the $100,000 mark. As a showcase event, the NSTA national convention became the prime and much coveted opportunity for all manner of presentations of innovations, curriculum development projects, viewpoints on controversial issues, instructional materials, and so on, usually followed by the give and take of discussion and debate. This was the opportunity also for many NSTA committees to hold open sessions in which to report what they were doing or proposing to do and eliciting the reactions, feelings, and recommendations of the membership. The convention pressroom each year prepared dozens of releases and distributed thousands of copies to the media nationwide. Fill-in and mail-back-home forms, plus envelopes and postage, were made available to registrants who wished to report the convention and their personal involvement through their hometown newspapers.

Although the pattern of a national convention may have appeared quickly to jell into a standard form, every planning committee truly had at least a 75 percent "blank slate" in matters of theme, format, schedule, and content; variations and innovations were encouraged. One requirement we tried our best to enforce was that ample, non-competitive "time to view the exhibits" be provided in the daily schedules. This was intended not only to make the exhibitors happy (and collectively they were paying more than $100,000 just for booth space), but also to serve the desires of the registrants.

For each President, the national convention became the top event, the most time-consuming activity of his or her year in office. Planning was started within a month or so after election as President-elect-elect with culmination nearly two years away. The Program Committee was usually comprised of a core of about seven to ten appointees reasonably representative of the diversity of association membership. This group was usually augmented by representatives of all the Sections of NSTA, the coordinator of local committees, and the President and Executive Secretary *ex officio*. As for innovations, several committees did break the mold and introduce new program elements (at

least they were new for NSTA). Most of these resulted from ideas, inspiration, and perhaps insistence of the President. In retrospect, I would regard the following as outstanding, significant examples.

1960 — Donald G. Decker, President. Emphasis on the science curriculum K-12. Opening general session involved a discussion of science study with 13 youngsters representing each of the school years K-12; what a stepladder array, both in physical appearance and vocal expression! This convention greatly advanced the work of the K-12 Curriculum Committee.

1962 — J. Darrell Barnard, President. This convention was structured to encourage study and discussion of five areas of science education and to develop a position statement for each. Small committees prepared working papers on the five topics, and these were duplicated and mailed to all members three months in advance of the convention. After the several discussion sessions at the convention, the committees produced revised versions and these were collated into a "White Paper" which was also widely circulated by the Association.

1966 — James V. DeRose, President. Two innovative features were introduced at this convention, and both of them persist to this day. DeRose felt that NSTA was not giving sufficient attention to the science component of science education and proposed that we build into our convention programs a series of short courses in contemporary science to assist in the continuing education of teachers. Topflight scientists were engaged to present three lectures in their respective fields of specialization and, in addition, to submit a 4,000-word summary manuscript for publication in one or another of the NSTA journals. To enable us to pay expenses and a modest honorarium to each speaker, about twenty business-industry firms responded to our plea for contributions of three to five hundred dollars each. Two years later (under President Morris H. Shamos), Sun Oil Company picked up sole sponsorship of these Science Seminars to the tune of $10,000 per year, and this cooperation has continued to date. DeRose was also concerned that "rank and file" members have increased opportunity to be platform participants in our conventions. The answer was to invite "members' contributed papers" for 15- to 20-minute presentations at scheduled sessions. The response

was more than gratifying with up to 300 or more submissions each year. Since extended to include area conventions as well as national, these contributed papers sessions to date have platformed approximately 2500 speakers, most of whom would have been unknown to and overlooked by program committees.

1969 — Elizabeth A. Simendinger, President. As would be expected, this year's convention focused on the Silver Anniversary of the Association and served as climax of nearly a year of SAY activities. Highlight was an elaborate multimedia review of NSTA events and persons through the years, prepared under the direction of Addison E. Lee and presented by him. This convention also served as the launching pad for major fund-raising in the Capital Fund Campaign under Morris H. Shamos.

1972 — Morris R. Lerner, President. A different kind of innovation appeared in this convention. During the year previous, a rather militant group of young people describing their mission as "science and engineering for the people" had appeared at several meetings of scientific societies and had broken up many sessions with disruptive, interruptive, sometimes egg- or tomato-throwing tactics. They showed up at NSTA's 1971 convention, but no trouble developed, probably because we "accommodated" them with space for hand-out literature (mostly to protest the Vietnam war) and invited and encouraged them to participate in various discussion sessions. Lerner and the 1972 convention committee invited representation from the group to share in planning the convention, allocated several program sessions to the group, and provided them with a headquarters room of their own. Although accused by some NSTA members of "giving in," the fact is we had no trouble from this source beyond a couple of minor disruptions. Such involvement of this group persisted through the next three NSTA conventions.

1973 — Elaine W. Ledbetter, President. This convention was notable for being dedicated to recognition of a retiring NSTA Executive Secretary. Since I was the cause of it all, the less said the better (but *I* thought it was great!).

1975 — F. James Rutherford, President. The *unfolding* of this convention was to come after the scope of NSTA history 1944-74, but *planning* for it occurred within the necessary time limit. As announced, this was to be a three-in-one

convention divided into three main divisions, or tracks, with events scheduled simultaneously for each track. Track I was to be the traditional array of workshops, science seminars, and contributed papers. Track II was to be concerned with science-society relationships, and Track III was to focus on the difficulties faced by minorities in our society and specifically in education. Although all of these areas of concern had been included to some degree in earlier conventions, 1975 was to be the first one to offer a full sequence of correlated sessions in each of the areas streamed throughout the convention from opening to closing gavel.

Appendix IV lists the locations of the conventions from 1953 to 1974, with the theme of the convention, and the names of the President, keynote speaker, and program chairman.

National conventions were indeed the number one showcase type activity of the Association. Membership participation in these conventions exceeded that of every other activity. They provided the occasion also for the annual meetings of NSTA Sections — AETS, CESI, CSSS, NAIEC, and NSSA. Other groups also held annual or major meetings in conjunction with NSTA conventions; e.g., National Association of Geology Teachers and National Association for Research in Science Teaching.

During a period of about 15 years, NSTA national conventions were augmented by up to eight to ten so-called regional conferences scattered across the country and held between late August and early December. Initially, NSTA meetings were twice a year — with NEA in the summer and with AAAS during the last week of December. Few science teachers, seldom more than 100 to 150, attended these meetings, however, because of the timing. In the fall of 1952, about six months ahead of the first national convention, the inaugural regional conference was held in Atlanta on the campus of the Georgia Institute of Technology. This meeting was notable not only for launching a series of regional conferences that continued through 1971 but also for being the first racially integrated meeting of our kind ever held at Georgia Tech. NSTA also had the distinction of breaking down the color barrier at the Martinique Hotel in Washington. It was 1953, and the NEA had purchased the hotel for later demolition to make room for expansion. The hotel continued to operate as a public place during the interim. One day I took an NSTA committee to the hotel dining room for lunch, only to be told that our two Negro members could not be

admitted. Washington was still a segregated city in those days. I replied in almost so many words, "This property belongs to NEA and we are an NEA-related group. Besides, your policy is stupid and we are coming in to be served. Call the NEA Executive Secretary or the police to throw us out if you wish." We were served. I sent a note of protest to NEA officials, and two days later a memo was circulated building-wide stating that any and all segregation practices at the Martinique Hotel were to be discontinued.

An important purpose in launching the regional conferences was to provide professional opportunities for teachers in localities where, for various reasons, most science teachers could seldom get away to attend the national conventions. During the years 1952-1971 well over 100 regional conferences were held in towns, sometimes on college campuses, all the way from Maine to Puerto Rico to Hawaii. Half a dozen of these were held in Canada, usually in cooperation with a Provincial science teachers organization. Many were located in sparsely populated areas (e.g., Albuquerque, New Mexico; Laramie, Wyoming; Grand Forks, North Dakota), and we were quite pleased to bring these professional offerings to the 219 to perhaps 487 teachers who would attend such meetings. On the average, regional conference attendance ran about seven hundred — a total of five to six thousand in a year of eight or nine conferences.

Some added evidence of appreciation for this service was that the regional conferences proved to be good occasions for membership recruitment. Usually fewer than 50 percent of the registrants were already NSTA members, and it was not uncommon to enlist 100 to 200 new members at one conference. At national conventions, on the other hand, approximately 90 percent of the registrants were members, and new enrollments seldom ran to more than 40 or 50.

By 1970, the regional conference idea seemed to have run its course. Attendance was dropping, the costs of putting on the conferences were mounting, exhibitor participation was declining (and hence that vital source of income to help support the activity), and deficits were beginning to appear — nearly $20,000 in one particular year. A revised plan for these meetings was proposed, carefully studied and discussed, approved by the Board, and put into operation in the fall of 1972. The new concept called for three area conventions (variously described as "mini nationals" or "maxi regionals") to be held each fall in carefully chosen locations and coordinated with the locations of

the preceding, current, and following national conventions. The idea was that over a span of two, or at most three, years approximately 80 percent of the nation's science teachers would be within two or three hundred miles of at least one NSTA convention. That this plan and its promise became truly operational is evidenced by the locations of area and national conventions during 1972-1975 (noting these locations on a map helps visualize the pattern).

Calendar 1972

National—New York, New York

Areas—New Orleans, Louisiana; St. Louis, Missouri; San Diego, California; also, a Regional Conference in Spokane, Washington

Calendar 1973

National—Detroit, Michigan

Areas—Norfolk, Virginia; Boston, Massachusetts; Portland, Oregon

Calendar 1974

National—Chicago, Illinois

Areas—Washington, D.C.; Memphis, Tennessee; Denver, Colorado

Calendar 1975

National—Los Angeles, California

Areas—Atlanta, Georgia; Indianapolis, Indiana; Oklahoma City, Oklahoma

The nature of the area conventions promptly took on much of the pattern of the national conventions — longer duration than the regional conferences, commercially sponsored workshops, science seminars and special workshops (several with NSF support), Life Members Breakfasts, contributed papers sessions, and an enlarged array of general sessions, panels, and meetings planned by NSTA Sections. Attendance ranged from about 1,000 to more than 2,000 for an average of approximately 1600. Exhibitor participation provided about one hundred displays per area convention compared to fifty or so for a regional conference and 200 or more for a national convention.

It would appear that everybody gained by the introduction of the three area conventions plan — everybody, that is, except possibly the 20 percent of U.S. science teachers still beyond the 300-mile reach of these and the national conventions. Were they to be ignored and forgotten? Well, not entirely; but they would be required to exert some initiative to be served. Simultaneously

with the move to area conventions, NSTA announced Association willingness, even eagerness, to encourage and assist with "drive-in conferences" of one or two days duration that would be initiated, planned, and conducted by local groups or individuals centering on whatever topic or for whatever audience they might choose. NSTA would provide all possible assistance that might be requested — such as officer and staff personnel, help with printing, help in lining up speakers — and also would contribute $100 to $300 or so toward expenses. This idea had been explored a few years earlier by NSTA, but now it was to be pushed. And succeed it did. Drive-ins were held for 27 physics teachers at a colloquium in Illinois, 375 junior high school teachers in Ohio, more than 800 elementary teachers in Alabama, and about 50 college science teachers in South Dakota. Many of the drive-in conferences have been cosponsored by state associations and NSTA. President Trowbridge reported that during his year in office (1973-74), attendance at the national convention was 5100, with 4100 at the three area conventions, and approximately 5,000 at 29 drive-in conferences held that year — a grand total of well over 14,000 science teachers served directly in one year.

Recognition and Awards

It was to be expected that sooner or later an organization as concerned about "the science teacher" as was NSTA would develop some kind of program to accord recognition and honor to certain of its members and other persons involved in the profession who performed or achieved in superlative measure. This was not a direct, spelled-out goal of the Association, however, but came about as opportunistic support emerged. In all, five different programs of awards for science teachers were developed, beginning in 1952-53 under presidents Baker and Wise, and four of these are still operative as of 1974.

When the American Society for Metals (ASM) in 1952 handed NSTA a check for $10,000 with which to conduct a national program of awards for science students, it was mutually agreed that a portion of the grant would be allocated to the recognition of those who "stood behind" the kids as motivators, coaches, and counselors — the classroom science teachers. Entrants in the competition submitted written reports of their best science teaching ideas, documented by evidence of success,

together with descriptions of special applications or limitations, and a team of judges selected the award recipients on the basis of such criteria as originality, clarity of presentation, potential for adoption or adaptation by other teachers, and suitability for publication. Resources for support of the awards were modest; in 1954, for example, there were cash awards of $400, $300, $200, and $100, and 10 honorable mention winners were identified, each of whom received an unframed certificate. Awards and kudos were bestowed at the banquet session of the national convention, and the names and addresses of all entrants (not only the winners and honorable mentions), together with at least the titles of their papers, were published in *The Science Teacher*, a total of 121 in 1954. Some of the participants, even among the "also rans," reported receiving a hundred or more letters of inquiry following this *TST* publicity. This may have been more gratifying than a certificate or even a cash award.

The ASM Recognition Awards for Science Teachers continued annually until superseded by the STAR (Science Teacher Achievement Recognition) Awards beginning in 1956. For the Association, the ASM experience served to establish teacher awards guidelines that have persisted to this day; notably:

- Emphasis shall be on science teaching ideas that have pay-off values in classrooms, laboratories, or field work at elementary, secondary, and collegiate levels.
- Participation in awards competitions shall be self-induced to the end that entrants and winners shall be those confident of having achieved in unusual manner or degree and willing to share with colleagues through the preparation of written reports and possibly of their publication.
- Awards shall be relatively modest if necessary in order that larger numbers of deserving entrants may be recognized and accorded significant honor.
- To the fullest extent feasible, the Association shall disseminate these outstanding science teaching ideas through publication in journals and topical publications, programming presentations at conventions, or by other means at its disposal.

Consistently, NSTA Boards of Directors supported these criteria as new or revised awards program proposals came up, and they shunned all opportunities and two or three specific invitations to establish or endorse some form of outstanding or teacher-of-the-year selections.

In the fall of 1955, President Stollberg and a committee carried out a highly successful drive-in, one-day conference at

the National Cancer Institute (NCI), Bethesda, Maryland, for nearly 200 teachers from Maryland, West Virginia, Delaware, and Pennsylvania. More than pleased with NSTA performance in this activity, which was aimed primarily at providing up-to-date information about cancer and related research, NCI invited a proposal for enlarged cooperative activity with broader scope and greater reach. Since the need for more dollar support for the ASM student awards program had increased, we proposed that the teacher awards be dropped from the ASM program and "offered" to NCI. ASM agreed as did NCI. The teacher awards program was renamed STAR, and in somewhat revised format continued under NCI sponsorship through 1962.

Supportive grants ranging from $25,000 to $37,000 were made available in alternate years; thus there were three NCI-sponsored competitions, each culminating in approximately 30,000 copies of a publication called *STAR Ideas for Science Teaching* (1956, 1958, 1960). In announcing the "STARS of 1960" (*The Science Teacher*, April 1960, pp. 6-11), it was said that "The winners of NSTA's 1960 STAR awards may be justly proud of the public honors accorded them at the Kansas City convention and in the press, of the $13,500 in prize money which they pocketed, and, most of all, of the professional service they have rendered to their fellow teachers of science and their students." More than 2500 teachers had requested entry forms and information and nearly 400 followed through with submissions. The judging committee selected one entry to receive a $1,000 first-place award, 10 for second-place awards of $500, 20 for $250 awards, and 25 to receive $100 awards. Additionally, 76 entries were honored with Meritorious Citations. In each of the three NCI years of STAR programs, ten to fifteen thousand copies of the *STAR Ideas* publication were sent *gratis* to superintendents of schools in the United States, the hope being that this and its persuasive covering memo would prompt the school administrators to promote science teaching in their respective systems more vigorously.

When NCI terminated support of STAR (because of limitations on grants for the support of ongoing versus experimental-developmental projects), the program lapsed for a few years. In 1966, President DeRose, who had been a three-time STAR winner and thus was convinced of its motivational and professional values, proposed that NSTA resume the program under its own resources, and the Board responded with a budget allocation of $2,000. Thus was STAR reactivated and

given a new lease on life; the members responded despite the four-year void and by 1968 had made the program vigorous and viable once more. Fortuitously so — because the American Gas Association, which had sponsored and paid for closed-circuit TV coverage of our national conventions piped into hotel rooms, lobbies, and exhibit areas, felt that this activity had run its course, was costing too much, and should be replaced by some other NSTA activity appropriate for AGA support. STAR was available, and AGA bought it. With a budget raised to $5,000 per year, AGA-NSTA STAR awards were initiated in 1969, have continued through 1974 without interruption, and seem likely to go on for who knows how long.

Meanwhile, NSTA's third teacher awards program (considering the ASM and STAR programs to be numbers one and two) was approved by the 1968 Board of Directors and became operative also during 1968-69. Sponsored by the Ohaus Scale Corporation and known as the NSTA-Gustav Ohaus Awards for Science Teachers, this program was patterned after STAR but with the subtle difference that emphasis was to be placed on forward-looking, creative ideas and proposals believed to hold high promise for affecting elementary and secondary science education in the future, rather than on past endeavors and achievements as in STAR. Some Board members questioned whether NSTA should accept sponsorship by an individual, commercial organization having science teaching materials for sale to science teachers, or limit our acceptances to groups such as trade associations and governmental agencies like AGA and NCI. Predominant opinion was that private dollars were as acceptable as any other kind, providing that the sponsored activities were fully under NSTA control from design through administration.

The Ohaus awards program was shifted to the college level in 1971-72 as a form of support for NSTA's venture with the *Journal of College Science Teaching*. Near the end of 1974 it became known that the prior program of elementary and secondary teacher awards was to be restored, and the college program continued. Thus the outlook that for 1975-76, NSTA would be operating three programs of recognition and awards for teachers — the AGA STAR awards and two offerings sponsored by Ohaus — with a total of $10,000 or so in prizes.

Four NSTA Citations for Distinguished Service to Science Education were presented at the 1967 national convention, thus inaugurating an internal program of recognition that had been

recommended by a study committee and approved by the 1966 Board of Directors. The intent of this annual program was to select a small number of individuals, within or outside Association membership, who have exerted active leadership and scholarly endeavor in science education over an extended period of time and to honor them "before the world" with citations recognizing their contributions and expressing appreciation from the profession as represented by NSTA. The purpose, spirit, and physical format of the citations closely resembles the nature of honorary doctorates as awarded by colleges and universities.

At the 1973 national convention in an atmosphere of great surprise (100 percent as far as I was concerned), the establishment and first recipient of the Robert H. Carleton Award was announced. This newest of Association recognition programs was established by the Board as "an enduring tribute" to the first NSTA Executive Secretary, who served September 1, 1948 through January 31, 1974, and to be awarded at appropriate intervals, not necessarily annually, to individuals who have demonstrated "unusually creative and exceptional leadership at the national level over a period of years." Announced as "the highest award the Association can bestow," certainly the action of President Ledbetter and the Board in establishing the RHC Award was for me the greatest honor of my career.

This has been a lengthy chapter but necessarily so as a review of Association endeavors directed toward the accomplishment of central purposes. Much was attempted, much was achieved. As this chapter reports, the Association has grappled with goals, policies, and issues; it has been concerned with curriculum design and content, instructional practices, instructional support systems, and the conditions or climate that affect science teaching. Extensive communications media have been instituted, extending not only throughout the membership but reaching the profession at large and, to some degree, both the scientific community and the general public. The journals of the Association have provided "a voice for science teachers" at elementary, secondary, and collegiate levels. NSTA conventions and conferences have provided platforms and forum settings for presentations, discussions, and debates. Self-esteem and professional status of science teachers have been enhanced through programs of recognition and awards.

In all — a glorious record, pride in which must be shared among thousands of individuals who have served in official capacities and on committees; who have been contributors to the

pages of the journals, program participants in conventions and meetings, and contributory competitors in the awards programs. Much external help along the way came from cosponsoring and funding companies, organizations, and agencies, thus providing the encouragement and dollars needed for numerous projects and programs. But a point to remember is that whatever the undertaking was, the underlying reason or purpose for doing it was the inherent potential for helping teachers and, through them, helping kids achieve higher levels of learning and satisfaction through their science education activities.

4

In Support of Future Scientists and Engineers

The National Science Teachers Association eased into involvement with youth science activities in 1946, launched its own program of student awards in 1952, established a Future Scientists of America Foundation in 1952, began to enroll Future Scientists of America clubs in 1957, helped nineteen students send their experiments aloft with Skylab in 1973, and as of the close of 1974 was engaged in a quest for a student-designed insignia to go on the Viking Lander, scheduled for launch to Mars in August 1975. During the intervening 28 years, NSTA conceived, designed, and administered more than thirty different programs of youth-oriented activities or specific projects which were supported by grants of more than two million dollars. Clearly, a review of such an extensive and diverse array of endeavors must form a separate chapter in *The NSTA Story: 1944-74*.

Early Endeavors

In accord with the climate of elation among scientists over their role in World War II and their feeling that the species must be nurtured and propagated, the AAAS in 1946 appointed a special committee to plan and conduct a Junior Scientists Assembly during its annual meeting, beginning with the meeting that year in Boston. Morris Meister, President of NSTA at the time, was named chairman of this committee, and thus NSTA immediately became heavily involved; in fact, our Association assumed almost total responsibility for operational aspects of the Junior Scientists Assemblies during the seven years that the program persisted.

The Assembly idea was to bring together perhaps ten to twenty "members of Junior Academies of Science, winners of the Westinghouse Science Talent Search, and recent members

of school science clubs" for a series of papers, talks, and discussions relating to a preselected theme. The first year's theme was: The Young Scientist Looks at Education and at His Work. Herbert S. Zim, then a science teacher in the Ethical Culture Schools, New York City, was coordinator of the first Junior Scientists Assembly, and his plan of organization of the activity prevailed through all succeeding ones. Usually, an Assembly included three or four sessions devoted to the theme. Because of lack of funds to support travel from a distance, the student participants mostly were from the metropolitan area surrounding the locale of the AAAS meeting. This meant heavy reliance on local teachers, and even more so on local NSTA members, to identify and assemble the participants. Unfortunately, the Assemblies never made much splash. It was hoped that the sessions would attract hundreds of high school students and teachers from the area as well as generous numbers of AAAS registrants. Neither hope materialized; seldom did the audiences reach 100 persons. Moreover, this kind of program got almost zero attention from the press beyond occasional reporting in local newspapers. The effort was abandoned after the 1953 Assembly.

The Science Talent Search (STS) for Westinghouse Science Scholarships and Awards was inaugurated in 1942, administered by Science Service and supported by the Westinghouse Educational Foundation. Science Service had been established in 1921 as an agency to provide science news to newspapers and other media, primarily to advance public knowledge and understanding of science. Watson Davis served as Director of Science Service until his retirement in 1965. An early activity of Science Service that impinged on schools and science teachers was the encouragement of local, regional, and area science fairs through co-sponsorship and financial aid of newspapers affiliated with Science Service. Science Clubs of America was launched in 1941, and in the same year, the Westinghouse Company and Science Service developed cooperation in conducting the Science Talent Search. NSTA was never involved, consulted, or jealous of this program. Pages in *The Science Teacher* were devoted to announcements about and the reporting of STS, but I cannot say that we really went "all out" in promoting it.

As for science fairs, NSTA consistently and from the very beginning followed a general hands-off policy in regard to any form of sponsorship, administration, promotion, or official involvement.

There was, of course, another side to the coin, and many advocates of science fairs would have had NSTA become actively involved in supporting and conducting this type of activity. Morris Meister and particularly Norman Jones were personally deeply involved in the science fair movement, but neither one as President really pressed a Board of Directors to get into the swim.

The "official" NSTA attitude toward science fairs, as I perceived it to be from the outset, was finally expressed in one of the first six Issues Statements adopted by the Board of Directors in 1968. It read as follows.

Science Fairs

The National Science Teachers Association recognizes that many kinds of learning experiences, both in and beyond the classroom and laboratory, can contribute significantly to the education of students in science.

With respect to science fair activities, the Association takes the position that participation should be guided by the following principles: (1) student participation in science fairs should be voluntary; (2) emphasis should be placed on the learning experience rather than on competition; (3) participation in science fairs should not be made the basis for a course grade; (4) science fair activities should supplement other educational experiences and not jeopardize them; (5) the emphasis should be on scientific content and method; (6) the scientific part of the project must be the work of the student himself; (7) teacher involvement in science fairs should be based upon teacher interest rather than on external pressures or administrative directives; and (8) if a science fair is to be undertaken, such an assignment should be a replacement for one of the teacher's current responsibilities, and not as an additional duty.[1]

It was the American Society for Metals (ASM) that unwittingly, unintentionally propelled NSTA into the action arena of sustained youth science activity programs. By 1950 to 1951, there was growing concern within the scientific and engineering communities over the shortage of manpower in these fields and the growing shortages projected for the oncoming decade or more. There was a great deal of "don't just stand there; do something, do anything" activity on the part of dozens if not hundreds of scientific and business organizations, trade associations, and other groups mostly in the form of so-called career information and guidance booklets for students. This concern to do something caught hold of ASM, and in early 1951 the executive secretary, William Eisenman, took an action proposal to the supervisor of science in the public schools of Cleveland, Ohio (where ASM headquarters was located) and asked for reaction

[1] "Science Fairs," *The Science Teacher*, November 1968, p. 44.

and advice. The supervisor was Arthur O. Baker, who was then President-elect of NSTA.

Eisenman's proposal was that ASM sponsor an annual nationwide essay contest for high school seniors on the subject, The Role of Metals and Metallurgists in Modern Life, and award $10,000 in college scholarships to three or four winners. His question was: How can we get into the schools? Baker knew, of course, that offering an essay contest to high schools would be like trying to enroll a child with measles in the second grade. He also saw the possibility of $10,000 a year becoming available to NSTA, explained the capability and potential of the Association to Eisenman, and successfully generated a conference with NSTA leaders in Washington within a month. By the time of the conference, Baker and Phil Johnson (then Specialist for Science in the U.S. Office of Education) and I had agreed on the general outline of a counter proposal. We would suggest a competition based on reports of investigative, research-type student projects and offering an array of modest awards beginning at seventh-grade level and extending through grade 12. Bill Eisenman was just about the most cooperative man we ever dealt with — meaning that he accepted our notions and recommendations promptly and with very little questioning or resistance. From here on, it was a matter of a few easy steps to the launching of the NSTA-ASM Science Achievement Awards in 1952.

As usual, a committee representative of the NSTA membership was appointed to develop the details of the program. The committee's report was ratified by the Board of Directors at the July 1952 annual business meeting. The underlying purposes and principles proposed by this committee served as guidelines for the NSTA-ASM awards program for 10 years and, in only slightly revised form, also served succeeding awards programs under other sponsorship for another decade. As a matter of fact, the central purposes, the basic philosophy, and the operational procedures of this program became key elements in the format of NSTA's Future Scientists of America programs later on, as we shall see. The principal points in the operational plan were these:

1. The program is intended to help increase the future supply of scientists, engineers, and technicians (other NSTA endeavors are aimed at improvement and advancement of science teaching in general).
2. The program shall be directed primarily toward identifying, stimulating, encouraging, and rewarding able, science-

prone students (the intent is to encourage students to undertake and continue the study of school science and mathematics and thus keep open the doors to science-related careers).

3. The basis for according recognition and the achievement awards shall be written reports of experimental, investigative, research-type, or field activities that the students have done (library research only and all semblance of an essay contest are ruled out).
4. For maximal educational impact, the program shall be as broadly based as feasible, student competition shall be minimized and kept as reasonable as possible, larger numbers of modest but meaningful awards shall be favored over fewer awards of scholarship-type magnitude, and all students who submit entries shall receive some form of recognition.
5. Schools and teachers that are identified as exemplary in providing the atmosphere, facilities, and instruction conducive to attainment of the goals of this program shall also be presented with suitable forms of recognition.

Based on the above tenets, the NSTA-ASM Science Achievement Awards program took on the following structural and operation features.

1. The program was open to all students in grades 7-12 in all junior and senior high schools throughout the United States (later, overseas schools and all "American schools" anywhere were included).
2. Submissions based on student projects or activities in any field or aspect of science and mathematics were eligible.
3. Competition was minimized and opportunities to "win" were increased by grouping entries in three levels — grades 7-8, 9-10, and 11-12 — and by dividing the country into 8 geographic regions; thus each entrant competed in only one of 24 categories.
4. The selection of winners and honorable mentions was done in each of the eight regions by a team of judges comprised of science teachers, supervisors, professors of science education, and scientists and engineers assembled by an NSTA-appointed chairman who served as program administrator for that region.
5. The suggested pattern of awards was not rigid but usually the judges selected from one to three First-, Second-, and

Third-place Winners and anywhere from none to 25 Honorable Mentions for each grade-level category.

6. The actual awards for Place Winners were U.S. Savings Bonds ranging in maturity value from $25 to $100; Honorable Mentions received specially designed certificates; all other entrants received Certificates of Participation.
7. Trophy case display plaques engraved with the names of all Place Winners were presented to the principals of their respective schools.
8. In the separate but related program of NSTA-ASM Recognition Awards for Science Teachers (based on submissions describing effective teaching practices), 20 awards of $50 each were given in 1952 and 1953; for 1954 and 1955 (until the STAR awards were instituted in 1956) the plan was restructured to provide awards of $400, $300, $200, and $100.

Our total allocation from ASM was $10,000 each year. This was broken down to provide $5,000 for student awards, $1,000 for teacher awards, and $4,000 for administrative costs (including the cost of plaques, certificates, and the printing and mailing of announcement posters, a Book of Rules, and entry forms). The NSTA-ASM program lasted 10 years. In a typical year of the NSTA-ASM collaboration, for example:

- We printed and distributed 50,000 copies of the announcement poster.
- 5,000 copies of the Book of Rules were mailed to teachers requesting it.
- Approximately 20,000 student entry forms were mailed to requesting teachers.
- Nearly 2500 students followed through with completed entries.
- More than 200 teachers representing all levels of teaching entered the teacher competition.
- More than 100 students received Place Winner awards (U.S. Bonds) and about 300 were accorded Honorable Mention recognition.

The Future Scientists of America Foundation

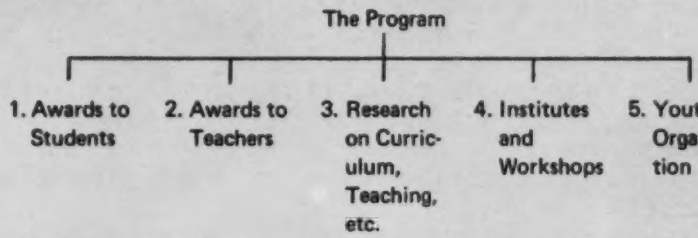
The NSTA-ASM awards project was not even off the ground when a few of us within the Association began thinking about and planning for a Future Farmers of America type endeavor for NSTA. This idea would be expected to pop up almost

spontaneously, considering the socioeconomic-political climate of the early 1950s: The United States was in a cold war with Russia; American science and the science-based industries faced a "critical shortage of technical manpower"; Russia was reported as turning out two to three times the number of scientists and engineers produced by American colleges and universities; and U.S. secondary schools were under scathing attacks for allegedly being soft on students, giving the students pap instead of academic meat, and, most of all, failing to offer and to stress upper level science courses (chemistry and physics) and mathematics. As we shall see, much of the shouting and the propaganda literature wittingly or otherwise employed the big lie technique. However, the desired result was more than partly achieved — almost feverish activity resulted in behalf of increasing the future supply of scientists, engineers, and technicians. It was natural, then, that NSTA should ponder some kind of Future Scientists of America undertaking; and the ASM offer to underwrite a program of student science awards served to accelerate our cogitations.

It fell to Phil Johnson and me to crystallize various and sundry notions of what to do and how to proceed. Lest readers be puzzled and Phil embarrassed by frequent mentions of him as this NSTA Story unfolds, let me explain that while he was blessed with a wealth of experience, had a wise head on his shoulders, and was a "founding father" of the Association (qualities which others also possessed), it was primarily his geographic proximity as Specialist for Science in the U.S. Office of Education in Washington that enabled and prompted us (and me in particular) to call on him frequently for help. Because of his position, he had extensive contacts with schools, teachers, and organizations throughout the United States and could give reliable estimates of how proposed new programs and services would be received. His deep, abiding interest in seeing NSTA flourish and truly serve the science teaching profession made him a ready and willing counselor. Moreover, these were the days before NSTA presidents had time off from their regular jobs and they had only meager financial support for travel; hence the presidents and I could seldom get together for productive planning sessions more than a couple of times a year, other than at our meetings with AAAS in December and NEA in June or July.

During the late fall months of 1951, we developed several drafts of organizational patterns and suggested activities, all of

which were variously "tried out" on reactors available to us within the Washington metropolitan area — junior and senior high school science teachers, science supervisors, college and university scientists, school administrators, and appropriate representatives of government agencies, business-industry organizations, and other educational and scientific societies. The following program was presented to the Executive Committee in February 1952 and was described as "a program to help assure scientists for research, engineering, teaching, and technology." The Committee voted $1,000 to finance the preliminary stage of the project and, in effect, said, "carry on."

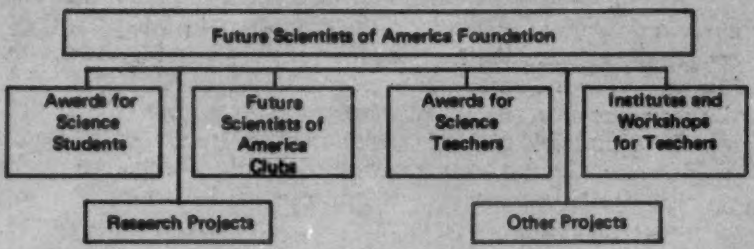


Within a month we developed some refinements of the February proposals, wrote and had printed a 14-page brochure setting forth the proposals, and set up an all-day conference on the whole idea, held on March 19, 1952. Since the NSTA Executive Committee had concluded that a fund-raising appeal from a future scientists organization would produce more response than if it came solely from NSTA the brochure was titled, *Proposals For the Future Scientists of America Foundation* (FSAF), further described "To Help Assure A Strong And Free America Through Adequate Scientists For Research, Technology, And The Teaching, Engineering, And Medical Professions." Organizations invited to participate in the conference (all of which sent one or two representatives) were listed as follows.

American Association for the Advancement of Science
American Chemical Society
American Dental Association
American Geological Institute
American Institute of Biological Sciences
American Institute of Physics
American Medical Association
American Society for Engineering Education
American Society for Metals
Atomic Energy Commission

Engineers Joint Council
Department of Defense
Federation of American Societies for Experimental Biology
National Academy of Science-National Research Council
National Council of Teachers of Mathematics
National Science Foundation
National Science Teachers Association
Science Service
U.S. Office of Education
(also represented at the conference were the NEA and the National Association of Secondary-School Principals)

The proposal as submitted to this conference included six action areas, substantially the same plan as approved earlier by the Executive Committee. In chart form, the proposal looked like this:



Proposed operational principles and guidelines included the following (abbreviated excerpts):

> The NSTA through its Board of Directors and Executive Committee shall be responsible for Association sharing in the development of policies for the conduct of FSAF. This responsibility shall be discharged through an Administrative Committee selected from the NSTA membership.
>
> The Administrative Committee shall be responsible for all operating policies of FSAF ... the establishment of committees ... and the operation of projects ... shall make allotments of funds for services and projects ... may enter into contractual arrangements with groups, institutions, and agencies for development and conduct of projects ... shall report at least annually to the NSTA Board of Directors.
>
> The Roster of Sponsors shall include all persons, business-industry organizations, and other groups of any kind

that provide grants in aid or other forms of financial support for FSAF activities.

The Roster of Advisory Groups shall include those organizations, agencies, and other groups that agree to endorse FSAF and cooperate in its program.

The Board of Consultants shall be comprised of the Administrative Committee and one representative of each of the Sponsoring and Advisory organizations.

Each FSAF project approved by the Administrative Committee shall be under the control of an operating committee selected by and responsible to the Administrative Committee.

The Association shall establish a separate account with NEA for the handling of all funds received and disbursed by FSAF.

As will be seen by close examination of the organizational chart and careful reflection on the operational principles, these proposals certainly set the stage for questions, ambiguities, confusion, and even conflict vis-à-vis the NSTA-FSAF relationship. Without question, the FSAF had to be a creature of and ultimately responsible to the Association in the person of the Board of Directors. On the other hand, FSAF had to be geared up for prompt decision-making and appropriate follow-up actions; such matters could not be kept on the shelf and brought out for review, debate, and decision only once a year at the annual meeting of the Board of Directors. And third, we recognized the harsh fact that NSTA's tie to NEA, thin as it was, was a severe handicap to us when attempting to gain support, cooperation, or grants in aid from certain organizations. To some individuals from business-industry, some of the scientific societies, and particularly the National Science Foundation, the sight, sound, or mere thought of NEA was anathema. We must have felt that perhaps FSAF could escape if it were one more step removed from NEA and made essentially an independent entity. As it turned out in practice over the next decade and more, I doubt that this maneuver had any positive impact whatsoever.

The Board of Directors by mail ballot voted tentative approval of the FSAF proposals by mid-April (the vote: 17 yes, 2 no, 4 not voting). Still another conference group was assembled in early May to polish off a final draft for in person review by the Board about six weeks later. The only major change coming out of this working group was to drop the proposed Future Scientists of America clubs and substitute Guidance and Other Ser-

vices to Students. Watson Davis of Science Service was a member of this team and he had won his battle against competition with Science Clubs of America (the battle but not the war, since NSTA did indeed launch an FSA Club program in 1957). At the June 24 session of the 1952 meeting of the Board of Directors, a few changes were made in the wording of certain passages in the proposal document and the amended whole was approved unanimously; FSAF was officially born.

FSAF in Action

First general announcement of FSAF appeared in the September 1952 issue of *The Science Teacher*. The first Administrative Committee was appointed with Phil Johnson as chairman, and the first order of business as established by this group was to get busy on a fund-raising effort.

The fund-raising effort consisted primarily of sending specially prepared mailings to several hundred companies, corporations, and trade associations and, second, of meeting in person with small groups of business-industry representatives willing to listen to our pitch and our appeal for help. The most successful meeting of this kind, at least in immediate payoff, was arranged for us in New York City by Norman Shepherd, Director of Research for the Allied Chemical Corporation. He did the inviting and assembled about twenty persons for a conference and lunch. On the spot or by mail within a week we had checks or pledges for a total of $18,000 in FSAF contributions. Comparable meetings were held in Detroit, Chicago, Pittsburgh, Cleveland, and San Francisco. Generally speaking, these meetings were arranged by one or more of our business-industry ambassadors, and the FSAF presentation was made by someone from this group and/or a delegated NSTA representative from nearby.

The net response to our mailings and meetings was gratifying beyond expectations if not hopes. Within two years, as many as 60 different contributors were providing $40,000 to $60,000 a year in general support of FSAF. Over, say, a three-year span, more than 100 different companies, corporations, trade associations, and a few other kinds of organizations, even a few individuals, would participate. Not only did general contributions average more than $30,000 a year through about 1968 (when "the shortage" of scientific manpower seemed over and a business recession was setting in), but earmarked grants for specific

FSA projects exceeded the total of all general contributions. By 1974, the grand total approximated two million dollars.

As FSAF got under way, we quickly discovered that "the proposal" as approved by the Board of Directors had to be used more as a flexible guide than as a firm blueprint to be engineered. Specific projects that hadn't been thought of emerged; a few projects requested by business-industry were activated; and some of the original proposed activities gained but little support among our advisers and were dropped. Even the "Foundation" cognomen was dropped in 1960 because of an emerging complicated situation relative to who had what tax-exempt status with the Internal Revenue Service. This was an important question to business-industry donors because their contributions, to be tax exempt, had to be limited to organizations on the IRS list of tax-exempt groups. One by one, the NEA departments began to seek their own IRS rulings, NSTA included, and for us it raised the question whether to seek a ruling also for FSAF. The question was resolved by terminating the FSAF; thereafter, the program became simply "FSA activities conducted by the National Science Teachers Association." As late as my last year in office, however, we still received two or three contributions in the form of checks written to Future Scientists of America Foundation.

At the outset, all we had by way of an action program was the one-year-old project of NSTA-ASM Student Science Achievement Awards, which promptly was renamed "FSA Science Achievement Awards, sponsored by the American Society for Metals, conducted by the National Science Teachers Association." By April or May of 1953 we had accumulated $25,000 or so in FSAF contributions and we were obligated to begin investing this money in various projects as promised. By then it had also become apparent that we would have to expand our headquarters staff if all regular programs and services plus the new FSAF endeavors were to be taken care of properly. The 1953 Board of Directors approved my request for an Assistant Executive Secretary and a secretary. Salaries and fringe benefits for these two (a total of about $15,000 in those days) were included in the NSTA budget and thus became, in effect, the Association's contribution to the cause of FSAF. To fill the post, I invited John H. Woodburn, who had been a colleague at Michigan State University in 1947-48 and was then teaching at Normal (Illinois) State University. John's creativity and tremendous capacity for innovative ideas, his writing skill, and his devotion to the central purposes of NSTA and FSAF were demonstrated time and again

during his four-year tour of duty on the staff. He resigned for other professional endeavors in 1957; 16 years later the Association honored him with a Citation for Distinguished Service to Science Education (see *The Science Teacher*, May 1973).

The unofficial, working credo for FSAF soon became: activities and services designed to help teachers help students have experiences comparable to those of practicing scientists and engineers. This guideline motto kept the teacher in focus as the key agent in the encouragement of future scientists; it ruled out such nonscientist activities as fairs and essay contests; and it provided the rationale for mounting a dozen or more projects of the following kinds (each listing accompanied by its scientist-engineer counterpart activity).

Awards for Students—Scientists do research or field work; they write and publish reports of their work; many are selected to receive awards in recognition of the quality of their work.

Student Science Clubs—Scientists organize, join, and participate in societies devoted to their fields of interest.

Student Science Congresses—Scientists assemble in various groups to read papers and engage in commentary and debate with their listening peers.

International Youth Science Fortnight—Scientists attend international meetings to exchange experiences and ideas and to fraternize with their kind from other countries.

Publications—Scientists both read a variety of publications and write for publication; many write for the general public as well as for the scientific community.

The above listing is incomplete, but it will suffice to indicate the kinds of criteria taken into consideration before deciding to activate a particular proposal, whether generated internally or submitted from outside.

For the purpose of reviewing the specifics of NSTA's FSA endeavors through the years, I find it most convenient to cluster them in these four categories; namely, those designed for students directly; those designed for teacher consumption; publications; miscellaneous others. Also, to avoid possible confusion and complicated explanations, I shall overlook that there was an FSAF for several years and refer to all specifics simply as FSA activities.

FSA Activities for Students

Awards

As already mentioned, the American Society for Metals terminated its support of the FSA Science Achievement Awards after the 1962 program. The program had been well received by teachers, student participation was excellent, and we were distressed at the thought of its folding. We wrote to many scientific and engineering societies seeking their support and financial aid in keeping the program alive for what we hoped would be an interim year — which is just the way things turned out. About ten organizations did put in $500 or $1,000 each, NSTA added $2,000, and we thus managed to maintain FSA Science Achievement Awards during 1962-63.

During that year we found a new sponsor: the Ford Motor Company. We worked out an agreement for a one-year "trial run," and then for three years. Ford dropped out after the 1966-67 program, and the FSA student awards program became dormant until a new sponsor was found two years later, producing a new arrangement and a modified program but which lasted only three years.

It was during Ford sponsorship that the FSA student awards programs reached their peak. The larger grant from Ford enabled us to enlarge greatly the numbers of awards in all grade-level divisions in all regions (soon increased from eight to twelve). Also, a talent-search type feature was added in that all regional winners in the 11-12th grade division were pooled and from these 35-40 papers, 10 "national winners" were selected to receive $1,000 college assistance scholarships. All other aspects of the program were essentially the same as those of the original NSTA-ASM design. In each of the last two years of Ford sponsorship, the 10 student winners and their respective science teacher-advisors were convened in Dearborn, Michigan, for three days of kudos, laboratory and other visitations, social activities, and some time for student seminars and discussions.

One day about two years after the close of the Ford-FSA program, I received a telephone call from an elated Eric Berger in New York City. He was editor of *Science World*, the science student publication of Scholastic Magazines, Inc. NSTA had had a mutually pleasant, fruitful relationship with *Science World* and Scholastic for several years. Eric and his staff annually

reviewed the papers submitted by entrants in the FSA awards programs, and edited versions of perhaps 50-60 of these were published in issues of *Science World* during a school year. Scholastic was publisher of the *Vistas of Science* books which NSTA produced over a five-year period. Eric and Scholastic were as eager as we were to see the student awards program resuscitated. His telephone call was to report, "I think we've found a sponsor for the FSA awards; come up to my office Thursday for a conference." The conference did come off, and it produced a number of surprises:

- The prospective sponsor was Standard Oil Company (New Jersey).
- When we got around to talking about budget, it was revealed that the annual supporting grant being considered was in excess of $100,000.
- It soon came out that a troika was being proposed for the conduct and administration of a revived program, the three being NSTA, Scholastic, and the Engineers Council for Professional Development (ECPD).
- And it did not take long for the ECPD representative to state, emphatically, that over the past decade engineering had been overlooked, overshadowed, and offended in most all efforts to encourage "scientific" manpower; that the FSA tag-line of previous awards programs would have to go and that the program itself would have to be redesigned drastically.

Three or four conferences later, an official agreement was drawn up and signed by all parties involved. It provided for a three-year operation with the principal points of agreement as follows:

- The program of awards for students will be called Tomorrow's Scientists and Engineers (TSE).
- Standard Oil Company (New Jersey) will provide $135,000 annually to underwrite the program, $100,000 to be distributed in awards and scholarships for students and $35,000 allocated to the costs of administration.
- The conduct and administration of the program will be shared jointly by NSTA, ECPD, and Scholastic under a division of responsibilities to be worked out by an administrative committee comprised of representatives of three organizations.

In actual practice, Tomorrow's Scientists and Engineers was really a continuation of the same design that had been used for the Ford-FSA awards. The same three grade-level divisions and twelve regional districts were retained as was the pooling of

12th-grade (but not 11th-grade) regional winners from which to select ten national winners of college scholarships. With the much larger budget, the numbers of regional winners were increased to more than 1,000, and each of the 10 national winners received a scholarship of $6,000 at the rate of $1,500 a year for four years of college. Thus $60,000 of each year's $100,000 for awards went to only 10 students, and only $40,000 was left with which to award 1,000 others. NSTA objected to this slicing of the pie, stating our belief in and preference for larger numbers of modest awards to provide widespread recognition and encouragement; but, of course, we acquiesced in the majority vote. We also felt that these large scholarships to national winners put us, in a sense, in competition with Science Service and the Westinghouse Talent Search. There is no reason to believe, however, that TSE and STS either helped or harmed each other to any degree. Moreover, in all three years of TSE, there were no double scholarship winners, no overlaps with STS, although a few students were among the finalists in both programs. Apparently, the judges for the two contests held to different sets of criteria.

Whatever the causes, teacher acceptance of and student participation in TSE never reached more than about 50 percent of the earlier peak years. By this time the "crisis" shortage of scientific manpower had been overcome, and campaigns to alleviate the situation had lost their steam. In fact, a surplus supply of scientists was beginning to build up. Also, the two-year lapse in NSTA student awards programs had cost a great deal of momentum; there was, no doubt, a turnover and loss of FSA-prone teachers during these years, and divorcing TSE from FSA and presenting it as "a brand new" offering was of questionable value. Thus the end came to NSTA's 21 years of efforts to provide science achievement awards for students.

Clubs

When FSAF was established in 1952, the earlier suggestion to include an FSA youth organization in the program was shelved — but not for long. By 1957 the idea was again alive and under consideration. In fact, the December 27, 1956 meeting of the Executive Committee authorized a special committee "to study the wisdom of developing a student organization related to the FSAF." One justification for such study, at least in NSTA minds, stemmed from the findings of a survey done by John

Woodburn very soon after he joined the staff and published in a 1953 report titled *Encouraging Future Scientists: The Situation*. The study probed a sample of secondary school science teachers and dealt with problems and recommendations related to "school participation in incentive programs and guidance services ... as are directed toward youth who are in a position to consider careers in science, engineering, and the science-related industries and professions."

The survey revealed that among 425 responding teachers, only 28 percent reported "operational" local science clubs in their schools and only 27 percent reported school science clubs affiliated with Science Clubs of America. These figures suggested that in half or more of the nation's secondary schools there was no science club activity at all and that in only about one-fourth was there much likelihood that an FSA club offering would compete or interfere with SCA.

After protracted study by one committee or another, finally a firm recommendation came through and at the 1960 annual meeting of the Board of Directors an FSA youth organization was approved. During the study period, both Science Service and the National Council of Teachers of Mathematics were invited to consider the possibility of developing a plan that would encompass SCA, the proposed FSA, and a comparable offering to mathematics students. We visualized an organization that would be co-sponsored by all three groups but would itself operate as an essentially independent organization. SCA promptly said, "No, thank you," and NCTM followed suit a couple of months later.

The FSA club plan that we developed was guided by an FSA Steering Committee but included no world-shaking innovations or departures from existing practice. Existing school science clubs and new ones that might be organized in junior and senior high schools were invited to affiliate. Soon the invitation was extended to science clubs in the upper grades of elementary schools; this was in response to numerous requests. Clubs became affiliated simply by filling out a data form which we provided and returning it together with a modest affiliation fee. There were annual dues for the maintenance of good standing and continued services. Each enrolling club was given a display plaque and a serial number as a chapter of FSA and was sent an immediate shipment of FSA lapel pins and wallet-size FSA membership cards in sufficient quantities for all of the club members.

The very first project of the club activity was the issuance in 1960 of the *FSA Sponsor's Guidebook*. The book was bound looseleaf style so that revision replacements and new materials could be added from time to time. One free copy was sent to the teacher-sponsor of each FSA chapter. The publication was also available for purchase by other teachers, and a revised edition of the *FSA Sponsor's Guidebook* was still included in the 1974 edition of NSTA's Publications List, over 20,000 copies having been distributed during the intervening years.

Services to FSA chapters were highly opportunistic. We were continually on the lookout for appropriate materials that could be procured in sufficient quantities for distribution to all chapters. The supply of such materials was pretty good — mostly from business-industry, government agencies, and voluntary organizations, and along with our own mailings of other FSA announcements and materials we were thus enabled to make perhaps eight to ten such distributions per year. One service that the chapters received regularly four times during a school year was NSTA's publication *The FSA Centrifuge*. A newsletter type medium assembled and edited by our staff director of youth activities, this publication served as an outlet for news and information, an exchange mechanism among FSA chapters, and a means for suggesting science projects and other activities. Usually, about five copies of each issue were sent to the chapter sponsor, which was all our budget could stand. Many sponsors clamored for more, for one copy for each club member, and some offered to pay for extra subscriptions. These overtures were resisted, however, and *Centrifuge* was maintained as a service to chapters, not to individual students.

From 1960 through 1973-74, approximately 15,000 FSA chapters were enrolled and assigned serial numbers. As is well known among practicing teachers, student interest in school science clubs waxes and wanes, clubs come and go, and science-teacher interest to sponsor clubs also fluctuates. During eight to ten peak years, currently active FSA chapters ranged from 2,500 to 3,000 or so in any one year. A decline set in about 1970, and by 1973-74 the number of active chapters had dropped below 1,000. We postulated two or three explanations but had no solid, supporting evidence. First, it seemed plausible that club activities and FSA awards no longer had great appeal because so many of the kinds of activities they were intended to encourage had become part of regular day-in, day-out classroom science teaching. That is, inquiry or investigative learning

and independent study had become more widespread and thus project studies and club activities seemed less glamorous, just more of the same thing. Our second hypothesis was that high school science study to a significant degree had become a victim of the Vietnam war protests and the anti-science sentiment that oozed through the population, particularly among the under-30 generation. Factual it is that the senior high FSA chapters were the first to go, leaving by 1973-74 a heavy preponderance of junior high and elementary school clubs.

At about the same time that NSTA was developing its FSA club program, the U.S. Federal Government took at least the first step also to enter the business of operating school science clubs. This was in the form of the 1958 Wright Bill (Wright was a Congressman from Texas) which, as passed by Congress, became Public Law 85-875. The Bill contained as its principal provision the issuance of a Congressional charter to some agency (unspecified) to carry on a national program of youth science activities, chiefly science clubs and fairs. We never learned the what, how, or why that induced Congressman Wright to sponsor this bill and to the best of our knowledge it was not subjected to any public hearings. As would be expected, however, NSTA opposed the idea as soon as we heard about it — not so much because of the State Departments of Education. The NSTA Board of Directors was appalled at the thought of such a federal octopus organization and adopted a resolution urging that no charter be granted to any group and instructed the Executive Secretary to determine the facts relevant to the proposed chartered group. A reply from the then Commissioner of Education Francis Keppel, published in the May 1964 issue of *The Science Teacher*, p. 67, said

> It is our present judgment that a single federally chartered organization might tend to stifle the initiative and inhibit the growth of other organizations which contribute to the success of student science club activities across the Nation. We believe that our most appropriate role is to make available to local, State, and national organizations such supportive and advisory services as they may desire in the development of more comprehensive science youth activity programs.

End not only of PL85-875, but also end of the NSTA story as regards science clubs for science students.

Meetings

In recognition of the fact that practicing scientists and engineers attend meetings to rub minds and elbows with their peers

and counterparts, three kinds of such meetings for science students were authorized to be components of NSTA's youth science activities program. We engaged operationally in two of these, played an advisory role in the third.

Late in 1960 we received a letter from one George McGowan inviting NSTA to provide U.S. representation in the upcoming Third International Youth Science Fortnight (IYSF) to be held in London, England, July 20-August 3, 1961. McGowan was Director of IYSF, which was an activity of the British Branch of Worldfriends, a non-sectarian, non-political, international organization founded in 1928 by Jan Masaryk, post World War I President of Czechoslovakia. There were branches of Worldfriends in many countries, including Canada, but little or none of that type of activity in the United States. It seems that the idea of IYSF originated in the British branch, and after two years of the activity it was decided to seek U.S. participation.

The central objective of IYSF was to advance and strengthen international understanding and goodwill among youth of ages 16-19 years, using science as the stem on which to grow the olive branches. The gathering was comprised of 400 or more students from 15 to 20 countries, mostly from Western Europe but in the later years also including Japan, one or two African countries, and (one year only, I believe) Yugoslavia. The national delegations were divided into groups of perhaps three to six students, and groups from various countries were mixed together for housing in residence halls of London University, also for meals in the University Commons. The program of activities consisted of addresses by eminent scientists, panel discussions, lecture-demonstrations, visits to laboratories and science-based industries, and several social events — in all, an excellent array of varied experiences plus a time schedule that permitted extensive sightseeing in London and visits to such nearby places as Stratford-upon-Avon, Runnymeade, Windsor, and Brighton.

The first NSTA delegation to the 1961 IYSF was limited to five students and one adult director-courier-chaperon, Millard Harmon, a general science teacher from Auburndale, Massachusetts. Aided by a grant from the National Science Foundation, we were able to offer this European Youth Science Study Tour at a total cost to the students of only $500. After IYSF, the group went to Paris where they picked up a small station wagon provided to us free of charge by Ford Motor Company, then traveled two weeks more through Western Europe.

The 1961 tour set the pattern for all others to follow — two weeks of IYSF plus two to three weeks of additional travel and science-related activities on the continent, the latter consisting of visits to museums (like the Deutsches Museum in Munich), science centers (the Pasteur Institute in Paris), UNESCO headquarters in Paris, universities (the University of Amsterdam), and informal get-togethers with foreign students (in West Berlin, Switzerland, and the Netherlands). But not all activity was confined to science. The 1964 delegation, for example, visited the Louvre in Paris, the Rijksmuseum in Amsterdam, Edinburgh Castle, the French Alps at Chamonix, the Nazi concentration camp at Dachau near Munich, and both West Berlin and East Berlin. At the latter, our group encountered a group of visiting young Russian soldiers and they, both groups, exchanged posing and picture-taking as one of our students conversed in Russian.

Returning home each year, the American IYSF'ers were overflowing with eagerness to "show and tell" about their experiences — and this they did with slides, tapes, mementos. and commentaries, to fellow students, PTA's, church groups, service clubs, and so on. Officers of NSTA were delighted with the nature and results of our IYSF participation, and it was a sad day when, after the 1971 trip, we realized that that was the end. The cause, we postulated, was a mixture of economic, political, and social factors. First, IYSF had become a rather expensive operation. We had to pay full, commercial airline fares, hotel room rates, chartered bus hire, and so on, which meant that the cost to students was considerable even though reduced two or three hundred dollars each by grants from NSF, NASA, and Scholastic. By 1970, the net cost was above $1,000 despite $3,000 in support money from Ohaus Scale Corporation and having reduced the tour to only 10 days beyond IYSF. Second, we felt that the drop-off in interest may have resulted partially from the anti- attitudes of the late years of the Vietnam war. Finally, conditions had changed markedly since 1961 when our IYSF cooperation had begun. Numerous international student exchange programs had been expanded or initiated and youth travel, particularly to Europe, was much easier and more extensive. Thousands of young Americans each summer were going to Europe at student fare rates for several weeks of leisurely, inexpensive travel by train, motor bikes, bicycles, or backpacking hitchhiking.

The Association's eight-year run of NASA-NSTA Youth Science Congresses began in 1963 with this announcement (*The Science Teacher*, September 1963, p. 51):

> If science students are to understand what science is and what scientists do, they must be given opportunities to perform as scientists. NSTA is now expanding its array of such opportunities through a new program ... with financial support and other forms of cooperation from the National Aeronautics and Space Administration ... 10 regional and one national NASA-NSTA Youth Science Congresses ... one (regional) to be held at each NASA Center (throughout the U.S.) ... three students from each regional Congress (to meet) in Washington, D.C. for a National Youth Science Congress.

The plan, which had emerged from a year or more of discussion with NASA educational services personnel, called for the assembly of 15 to 20 students at each center for a three-day conference, during which they would present papers, hear critiques of their work by NASA scientific personnel, science teachers, and their peers, participate in discussions with NASA and brought-in scientists and engineers, and visit the NASA Center laboratories. For the 1963 Congresses, participants were hastily chosen from among outstanding students recommended by the leaders of other youth science programs; e.g., Junior Academies of Science, Ford-FSA Awards, and the Junior Science and Humanities Symposia. Thereafter, interested students applied for acceptance by submitting abstracts summarizing their science projects. A regional chairman and selection committee reviewed the submissions and picked the students for participation.

After two years the National Congress was dropped in favor of providing more support for the Regional Congresses so as to strengthen them and increase the number of participants to 25 to 30 students. Interestingly, there were no chosen "winners" in the Youth Science Congresses; all participants were treated alike. Each one received a plastic-embedded medallion, a certificate of participation, and "the honor of selection"; additionally, a certificate in the name of the student was issued to his or her school.

NASA support for the Congresses was on a year-to-year basis; we could not be certain at the end of one annual program whether there would ever be another. Usually we had only a couple months lead time during which to print materials, prepare mailings, line up regional chairmen, and so on. Initially, we expected that support might continue for about three years — more or less as a demonstration period for the Youth Science

Congress idea — and that during this time we would line up business-industry sponsors to pick up the tab for Congresses to be held at or near their respective research centers. NASA seemed highly pleased with the Congress program and continued to renew its support year by year through 1970. NASA-NSTA Youth Science Congresses stimulated over 20,000 students to submit application abstracts and served 2,500 of these directly as Congress participants.

The third kind of meetings for science students with which NSTA became associated was called the National Youth Conference on the Atom (renamed National Youth Conference on Science and the Environment in 1972). Originated in 1960, this conference was financed and sponsored by a consortium of about 60 "investor-owned" electric utility companies scattered throughout the United States. Organization and management of the conference were assigned to a public relations firm located in New York City — one with which NSTA had had previous contacts through our business-industry relations programs, which probably explains why this firm came to NSTA seeking information and counsel following the first Youth Conference. There was also a request for NSTA approval or endorsement and the Board of Directors granted the request. I do not recall any other activity, project, or organization similarly endorsed by NSTA. From 1961 onward, NSTA and FSA were listed as co-sponsors of the National Youth Conference on the Atom.

The announced chief purposes of the annual conferences were "to present to a group of the nation's most gifted high school science students and teachers an authoritative and inspiring picture of the promise of the peaceful atom ... and to help advance interest in the study of science." In pursuit of these goals, approximately 300 students and 200 teachers were brought together each year in Chicago for a four-day meeting. The program usually included several addresses by eminent scientists from government and private industry, discussion sessions for groups of students and teachers, and visits to the nearby Argonne National Laboratory and the Dresden nuclear power station. Practically all program content focused on current research and achievements in the field of nuclear science. NSTA had no hand in the selection of student or teacher participants but did provide suggestions and evaluative comments on program structure and content. Most NSTA presidents from John Marean (1962-63) onward, our staff director of FSA programs, and other designated representatives attended the con-

ferences, participated as chairmen of sessions, panel moderators, leaders of discussion groups, and post-conference evaluators. The National Youth Conference on Science and the Environment was a continuing activity as of 1973-74.

FSA Activities for Teachers

In the early days of FSAF, four different programs were designed specifically for science teachers, all of them aimed at one or both of two main purposes: first, to supplement teachers' incomes and thus enable or encourage them to continue classroom teaching; second, to help teachers have experiences with scientific research and development so that, we hoped, they would be better equipped to help their able students engage in the kinds of activities that practicing scientists do. Moreover, these teacher programs from the outset were conceived to be more in the nature of pilot studies or demonstration runs of ideas that other groups with greater resources than we could muster would pick up and carry on, rather than as programs which FSAF would seek to operate indefinitely.

Summer Jobs in Industry

"How ya gonna keep 'em down on the farm?" aptly applied to science teachers during the decade of the 50s, plus or minus a year or two at each end. Significant, even alarming, numbers of science teachers were leaving the classroom each year for higher paying jobs in industry. As one junior high teacher in suburban Maryland whom I knew personally put it, "I cannot afford to keep on teaching at $2,600 a year; perhaps $4,000, yes. But I have been offered $5,200 by X company; I've got to take it." The science teacher exodus coincided with a general shortage of teachers throughout the profession. Year after year during this time, NEA annual studies of teacher supply and demand showed the June crop of newly graduated, certified teachers to be far below the following September demand, with the greatest shortages showing up in mathematics and science, physics in particular (see "Is the Science Teacher Shortage A Curriculum Factor?", *The Science Teacher*, May 1956, pp. 181-183). As school officials strove to put warm bodies in the classroom as teachers, an estimated more than one hundred thousand "out of license" (uncertified) persons were playing the role.

The Association's efforts to activate one idea for coping with the situation were announced as follows (*The Science Teacher*, February 1954, p. 41).

> Through the efforts of the Foundation (FSAF), the NSTA is alerting thousands of industrial organizations to the availability during the summer months of a pool of trained manpower — the men and women who teach science in the nation's high schools. We are reminding industrial leaders that these people can fill in nicely during vacation schedules and will certainly appreciate the additional income during the summer months. Most important of all, as one science teacher has put it — "Teachers will value the enrichment of their training that will come from industrial experience and everyone will gain from letting industrial people see the ability and enthusiasm of the members of our profession."

A brochure was prepared, titled *Let's Help America's Science Teachers Find Science-Related Summer Jobs in Industry*, and thousands of copies were mailed to industrial executives thought to be in a position to provide the science-related summer jobs. Endorsement of the plan was provided by then U.S. Commissioner of Education Samuel Brownell (son of Herbert Brownell, perhaps the leading science educator of the early 1900s as professor at the University of Nebraska): "In my judgement, practical experience which gives insight into industrial applications of mathematics and science would, by adding reality and competence, improve the effectiveness of teaching of these subjects in American secondary schools."

We kept this program going under active promotion for three years. We had no reliable feedback as a means of evaluating success. No more than 15 to 20 teachers wrote to us each fall to report that they had thus been employed during the summer, and we had to wonder whether there were several tens or hundreds more like them who did not write. In a follow-up study done for us by J Ned Bryan (professor of science education at Rutgers University) and a graduate student, various operational aspects from industry's point of view, perceived values to industry, and hazards or obstacles in the plan were probed. Among the findings, employing industries reported hiring from five or six to as many as fifty science teachers during summer vacation periods. We estimated that probably 2,500 to 3,000 teachers in all were thus employed during a given summer — not a large number, perhaps, but that many better than none. Several thousand copies of the report were circulated back to industry, and thereafter we depended on nature to take its course in keeping open the doors to science-related summer jobs for science teachers.

Summer Research Assistantships

Closely akin to summer industrial employment in concept, an effort to generate High School Science Teachers Summer Research Assistantships was inaugurated for the summer of 1955. The idea was to encourage colleges and universities to engage science teachers to be assigned as involved participants (not bottle washers) in research projects being carried on by the science professors. The teachers would work approximately 200 hours during six to eight summer weeks and would receive $400 and one or two courses free of tuition as compensation. FSAF would play the role of middle agent, compiling and announcing the assistantships made available, receiving inquiries from interested teachers, and then putting the two groups in touch with each other for appropriate follow-up.

The proposal caught on quite well, we thought. The first summer's pilot run elicited cooperation from 25 colleges and universities and a total of 35 research assistantships. In the third, and our last, summer of pushing this program, approximately 90 colleges and universities offered nearly 300 assistantships. Feasibility and acceptability of the idea had been amply demonstrated. A year later, NSF authorized up to $800,000 for assistance grants to colleges and universities to expand and continue this type endeavor. After a second year, however, the whole thing was terminated — probably having been evaluated as a good idea but not world-shaking or highly significant in impact.

On-the-Job Research Grants

This program was designed to demonstrate that science teachers themselves and their able students can engage in honest-to-goodness scientific research within the setting of the more or less typical high school. The 1956 FSAF Administrative Committee allocated approximately $2500 to the project, and it was announced that grants in the range of $100 to perhaps $500 would be available to teachers upon application. An application consisted of an account of what was proposed in the way of a research project, an indication of the extent and nature of student involvement, identification of scientist-advisor assistance if any, a portrayal of budget, and justification of the support requested of FSAF. Since we received requests for two or three times the amount of money we had available, a selection com-

mittee was named to review the applications and to award grants. During the three-year life of On-the-Job Research Grants, recipients numbered five to ten per year and two of the grants were for $1,000 each. Considerable publicity about the program appeared in *The Science Teacher*. We depended primarily on this to report what could be done and to encourage science teachers to plan such activities with their students and to seek enabling assistance, both advisory and monetary, from scientists and institutions within their own communities. How much of this happened across the land is another unknown, but verified reports reached us from perhaps fifty teachers who developed teacher-science advisor-science student collaboration.

One of the recipients of a 1956 grant from the National Institutes of Health was a young chemistry teacher in Evansville, Indiana. He and his students carried on a project dealing with free amino acids with such productive results that the research was published in a scientific journal (see also *The Science Teacher*, December, 1957, p. 389). A year later the work was further supported by a $22,000 grant. Having gained national attention and recognition, the young teacher was hired into the Washington headquarters office of the American Chemical Society in 1960 — thus ending the research and his career as a high school chemistry teacher. And who would have guessed that in 1973 he, Robert L. Silber, would become the second Executive Director of the National Science Teachers Association?

Summer Conferences

Already recorded in Chapter 2 is the fact that Harry F. Lewis of the Institute of Paper Chemistry in Appleton, Wisconsin was the ambassador who induced the pulp and paper industry to join the FSAF endeavor by supporting summer conferences for high school science teachers. There were seven such conferences in all — three supported by the Crown Zellerbach Foundation, two by West Virginia Pulp and Paper Company, and one each by the Marathon Corporation and the Scott Paper Company. Each conference was convened on the campus of a cooperating college or university, which provided facilities for housing and meals, classrooms and laboratories, and some staff. With supporting grants of $10,000 to $15,000 per conference, we were able to cover all expenses of travel, lodging, meals, field trips, and other administrative tasks and allocate in-pocket fel-

lowships of $200 to $300 to each of 25 to 35 participants. All conferences were of two weeks duration.

Conceived to be a research-type or experimental approach to solving some of the problems confronting science teachers, certain questions were posed as exploratory issues for the early conferences.

Are fellowships for summer conferences a good way for industry to supplement science teachers' salaries?

Can the methods and organization of successful research laboratories provide clues for the improvement of school science laboratories?

Can high school science teachers and public and industrial research people discuss common problems and share mutually desirable suggestions?

Can a group of selected teachers work toward the solution of a professional problem and, at the same time, gain self-improvement?

Can a conference group of teachers produce a publishable manuscript that is geared to everyday problems of the nation's science teachers?

In pursuit of inquiry on these and similar questions, each conference was planned to concentrate on one theme or problem. Conference time and activities were divided approximately into thirds — one-third devoted to gaining knowledge through lectures by scientists, laboratory visitations, and field trips; another third to how to bring new knowledge to bear on curriculum and instruction; and the third third to writing "a report to the profession" dealing with the conference theme (see "Science Teachers Explore Research," *The Science Teacher*, November 1954, p. 269). It was our belief that we had an obligation to disseminate all conference results as widely as possible beyond the conference group of teachers. Accordingly, each conference group produced a report — seven in all — published as a special feature in *The Science Teacher*, thus reaching an estimated ten to fifteen thousand readers. The three Crown Zellerbach reports were titled "New Ideas for High School Laboratory Activities," "Science-Related Mathematics Exercises," and "Stepping Stones to Careers in Science and Engineering." Some evidence that the reports were found helpful by other teachers stems from the fact of sales of 2,000 or more reprints of each one.

The summer conferences came to an end with those in the summer of 1957. By then the NSF Summer Institutes program had been expanded to accommodate several thousand teachers

and "what more good could one or two FSAF summer conferences do?" was the rationale for the sponsors to withdraw. We felt that our conference design with its three-pronged approach was superior to the typical Summer Institute, which zeroed in on science subject matter almost exclusively, and we wished we could have had funds with which to run even three or four such conferences for six- to nine-week periods each summer.

FSA Publications

Reaching out into the profession with timely publications was a high-priority activity of FSA from the very beginning of the Foundation. Some of these were designed to serve students directly, others were aimed at science teachers and guidance counselors. Until we ventured into the publication of *Tomorrow's Scientists* (a periodical for students) and the Vistas of Science series, FSA publications were single-title, monograph- or bulletin-type productions.

Miscellaneous Publications

First off the press was a coordinated series of three titles intended to strengthen the base for FSA in general and the student awards program in particular.

Encouraging Future Scientists: The Situation was the report of a survey of the nature and extent of youth science activities in the schools and of teachers' needs and desires for something more or different in this area.

Encouraging Future Scientists: Student Projects was an effort to suggest a range and variety of kinds of investigations that could serve as the basis for student participation in awards programs, science fairs, and science clubs — or, simply as ideas for independent study and personal satisfaction.

Encouraging Future Scientists: Services and Materials Available was a bibliography of career information and guidance materials relating to fields of science and engineering and available free or at low cost from industry, trade associations, voluntary groups, government agencies, and other such sources.

Very soon after these three titles, *If You Want to Do a Science Project* was published. This booklet tried to give suggestions (more so than "how to's") on all aspects of doing an investigation as a practicing scientist might — all the way from identifying

a problem to planning the experimental design and instrumentation, recording data, interpreting findings, and writing a report. This booklet was quite popular over its five-year life span; some 25,000 copies were printed and sold.

The third title in the Encouraging Future Scientists series was soon renamed *Keys to Careers in Science and Technology*, and revised editions have been produced every second or third year ever since the first. It is currently on the list of NSTA publications and more than 300,000 copies have been distributed since its inception in 1954.

The *FSA Sponsor's Guidebook* was initiated promptly as a service to teacher-advisers of the FSA chapters as they enrolled with NSTA. It was also made available as an NSTA sales publication and was sufficiently in demand (500 to 1,000 copies sold per year) that it remains on the list today.

As a further service to teachers and students in search of ideas for science projects, a series of "FSA Investigations" was carried in *The Science Teacher* over a period of about two years during the mid-60s. The investigations consisted of edited abstracts of papers submitted by student winners in the FSA awards program. The abstracts were prepared for us by Victor Showalter and Irwin Slesnick, both connected with The Ohio State University at that time. In 1968, these *TST* abstracts plus a good many more were reorganized and put out as a separate publication titled *Award-Winning FSA Science Projects*. This was a very useful book since it portrayed more than 200 top-quality projects in all areas of science — biology, physics, earth science, others — at levels of sophistication from grade 7 through grade 12. Sufficient demand has kept this publication on the list for seven years.

As spokesman for the science teaching profession, NSTA put out its first edition of "how to become a science teacher" as an FSAF activity in 1955. With several changes in title through the years and many different persons and groups contributing to the preparation of various editions, today's version of this NSTA publication is titled *Science Education for You?*, written by several science teachers, supervisors, and college science educators from the Philadelphia metro area under the leadership of Frank X. Sutman of Temple University.

Tomorrow's Scientists

The idea of publishing a periodical designed expressly for junior and senior high school science students was another of

the early proposals put before the FSAF Administrative Committee. No such publication existed at that time (1954-55). True, there were *Science Digest* (published commercially) and *Chemistry* (published by Science Service and later taken over and still published by the American Chemical Society), but neither of these came even close to our notion of what a student science publication should be — written at the reading levels of students, cognizant of the interests and activities typical of young adolescents, related to the school science curriculum, and supportive of what science teachers and guidance counselors were trying to do in the first place. With FSAF approval and a modest budget to go on, *Tomorrow's Scientists* was launched on a trial run basis in 1956 with the publication of four issues.

A startling revelation hit us just as we were about to begin the *TS* project. I received a visitor one day — the president of Street and Smith, publishers of *Popular Mechanics, Popular Science Monthly,* and other such magazines — whose mission was to ask for NSTA advice on a new venture his company was set to undertake; namely, the publication of a student science magazine to be called *Science World*! This was more than a dash of cold water on our plans for *TS*; I could see immediate and overwhelming competition that would force us out before we even got in. My visitor knew but little about NSTA (and nothing at all about FSAF) but somehow came to feel that we could be a source of advice and assistance to success for his new magazine. I told him more about NSTA, FSAF, and our own plans to launch *Tomorrow's Scientists*. And that, of course, was his dash of cold water.

Both Street and Smith and NSTA went ahead with their respective projects, and thus it was that science teachers and science students were suddenly confronted simultaneously with *two* new publications vying for their support. To us, however, the competition was very one-sided. During 1956-57, our first full subscription year (at $1 per year for eight issues), the paid circulation of *Tomorrow's Scientists* reached about 17,000. Reports were that *Science World* sold 10 times this number of subscriptions. Even so and whatever the number, the response was far below what seemed necessary for a commercial enterprise, and word quickly reached us that *Science World* was a failure, was up for sale.

During the next year, *Science World* struggled along and *TS* subscriptions climbed to about 30,000. We were elated with our degree of success, but we also felt increasing pressure on budget

and staff to meet the needs of the project. FSAF could not increase its allocation of contributed funds, we feared to increase the subscription rate, and we could not hire additional staff to pick up the increased work load. We faced some problems.

It might be said that it was Scholastic Magazines, Inc. to the rescue, both of Street and Smith and of NSTA. During 1958-59, Scholastic negotiated the purchase of *Science World*, and NSTA came to an agreement with Scholastic to merge *TS* into the new format of that magazine. This meant that we terminated our adventure with a science student periodical but had found another, greatly enlarged outlet for feeding NSTA material to U.S. science students and teachers. Our contribution to *TS* was a four- to eight-page section headed "Tomorrow's Scientists" in each issue and consisting mostly of abstracts of entries in our student awards programs. Scholastic Magazines, Inc. enjoyed excellent status among school people for the reputation of its other scholastic publications, and the new *Science World* quickly climbed to approximately 400,000 circulation. We were pleased with our involvement, which continued until the demise of the Tomorrow's Scientists and Engineers awards program in 1972.

Vistas of Science

In retrospect, it seems that NSTA was never satisfied with even a year or two of *status quo*, never content to let well enough alone. The very year that *TS* was terminated through merger with *Science World* we launched another publishing venture that produced 13 individual pocket-size, paperback "science books for youth" under the series title, Vistas of Science. Such books had been suggested a decade earlier by the NSTA Committee on Professional Projects, but at that time no support or means to activate the idea could be found. But now, in 1960, the FSA oversight committee came up with a bright idea: find appropriate sponsors who will share our interest in doing specific titles and use their dollars to develop the manuscripts. As for publication, that was readily solved also by extending our *Science World* relationship with Scholastic Magazines, Inc. Scholastic Book Services, Inc., agreed to be the publisher. During the next 5 years, the 13 Vistas of Science books and their respective authors, scientist advisors, and sponsors were:

VISTAS OF SCIENCE

Books Published

December 1961 – September 1967

Title	Text Author	Activities Author	Scientist	Cooperating Organization
SPACECRAFT No. 1	*James J. Haggerty, Jr.* Editor, *Aerospace Yearbook*, Aerospace Writers Assoc., Washington, DC	*John H. Woodburn* Science Teacher Walter Johnson H.S. Rockville, MD	*John F. Clark, Director*, Geophysics and Astronomy Programs, NASA, Washington, DC	National Aeronautics and Space Administration
EXPERIMENTATION AND MEASUREMENT No. 2	*William J. Youden*, Statistical Consultant, National Bureau of Standards, Washington, DC		*T.A. Willke*, Mathematical Statistician, National Bureau of Standards, Washington, DC	National Bureau of Standards

Title	Text Author	Activities Author	Scientist	Cooperating Organization
FRONTIERS OF DENTAL SCIENCE No. 3	11 Dental Research Scientists Editors: *George C. Paffenbarger*, ADA Research Division, National Bureau of Standards, Washington, DC *Sholom Pearlman*, Secretary, ADA Council on Dental Research, Chicago, IL	*Walter Brown*, Director of Youth Activities, NSTA, Washington, DC Formerly: Science Teacher University School Florida State Univ. Tallahassee, FL	*George C. Paffenbarger* and *Sholom Pearlman* and other authors	American Dental Association
CHALLENGE OF THE UNIVERSE No. 4	*J. Allen Hynek*, Director, Dearborn Observatory, Northwestern Univ. Evanston, IL	*Norman Anderson* Assistant Professor of Education, North Carolina State College Raleigh, NC Formerly: Science Teacher Pleasant Valley H.S. Bettendorf, IA	*Nancy Roman*, Chief, Astronomy & Astrophysics Programs, NASA, Washington, DC	National Aeronautics and Space Administration
MICROBES AND MEN No. 5	*Harold J. Simon*, Assistant Professor of Medicine and Microbiology, Stanford Medical Center, Palo Alto, CA		*René J. Dubos* Rockefeller Institute New York, NY	National Cancer Institute

Title	Text Author	Activities Author	Scientist	Cooperating Organization
CERAMICS—STONE AGE TO SPACE AGE No. 6	*Lane Mitchell*, Director, School of Ceramic Engineering, Georgia Institute of Technology, Atlanta, GA		*G.C. Robinson*, Head, Department of Ceramic Engineering, Clemson College, Clemson, SC	Metallurgy Ceramics Foundation, Inc.
CHEMISTRY OF LIFE No. 7	*Katherine Hoffman* Associate Chairman, Department of Chemistry, Florida State University Tallahassee, FL	*Archie L. Lacey* Department of Education, Hunter College, New York, NY	*Harold P. Morris* Nutrition and Carcinogenesis Section, NCI, NIH Bethesda, MD	National Cancer Institute
THE LORE OF LIVING PLANTS No. 8	*Johannes van Overbeek* Chief Plant Physiologist, Shell Development Co. Modesto, CA	*Harry K. Wong*, Science Teacher, Menlo Atherton HS Atherton, CA	*Harry Borthwick*, Plant Physiologist USDA Agricultural Research Service, Beltsville, MD	Agricultural Research Service
METALS, ATOMS, AND ALLOYS No. 9	*Charles Law McCabe* and *Charles L. Bauer* Department of Metallurgical Engineering, Carnegie Institute of Technology, Pittsburgh, PA		*John K. Taylor*, Chief, Applied Analytical Research, National Bureau of Standards, Washington, DC	Metallurgy Ceramics Foundation, Inc.

Title	Text Author	Activities Author	Scientist	Cooperating Organization
NUTRITION SCIENCE AND YOU No. 10	*Olaf Mickelsen*, Professor of Nutrition College of Home Economics, Michigan State University, East Lansing, MI		*Ruth Leverton*, Assistant Administrator, Agricultural Research Service, U.S. Department of Agriculture Washington, DC	Agricultural Research Service
LIFE BEYOND THE EARTH No. 11	*Samuel Moffat, Joshua Lederberg*, and *Elie Shneour*, Stanford Medical Center Stanford University, Palo Alto, CA		*Richard S. Young*, Life Sciences Lab., NASA Moffett Field, CA	National Aeronautics and Space Administration
MAN'S CONQUEST OF SPACE No. 12	*James J. Haggerty, Jr.* Editor, *Aerospace Yearbook*, Aerospace Writers Association, Washington, DC	*Victor Showalter* Instructor, University School, Ohio State University, Columbus, OH	*John F. Clark*, Director Geophysics and Astronomy Programs, NASA Washington, DC	National Aeronautics and Space Administration
SECRETS OF THE NUCLEUS No. 13	*Joseph S. Levinger* AVCO Visiting Professor, Laboratory of Nuclear Studies, Cornell University Ithaca, NY	*George L. Carr* Science Education Department, Cornell University, Ithaca, NY	*Samuel Goudsmit* Chairman, Department of Physics, Brookhaven National Lab., Atomic Energy Commission Upton, NY *Philip Morrison* Professor of Physics Cornell University Ithaca, NY	Atomic Energy Commission

It was the design and method of preparation that we thought made the Vistas books unique. For each one, a scientist principal-author was commissioned to do the bulk of the writing, but also commissioned as a collaborator was a science educator or science teacher with two chief responsibilities: first, to review manuscript and help keep the material "appropriate" for high school students; second, to write a section of the book that would give concrete suggestions for projects and other student activities related to the science content of the book. A small advisory committee comprised mostly of classroom teachers was named for each book, and this group assisted by reviewing copy and making suggestions as the project matured.

The sponsors' grants (ranging from $3,500 to $5,000 for each book) enabled us to pay expenses of meetings for planning and review, provide modest honoraria to authors, and retain a small portion (perhaps $500 to $750) as partial reimbursement for staff administrative and editorial service. Marjorie Gardner for NSTA and Eric Berger for Scholastic carried most of the burden of bringing the Vistas idea to fruition. In fact, Gardner joined the staff in January 1961 with the title, Director of Vistas of Science. About a year later, however, a staff editor for the Vistas books was hired, and Gardner was transformed into Assistant Executive Secretary (in which role her highlight accomplishments were, without doubt, the production of the 1962 curriculum position statement and the development of *Theory Into Action* and the Conceptual Schemes of Science; in 1974 she became the second recipient of NSTA's Robert H. Carleton award). Scholastic published and marketed the books as a straight commercial enterprise with a modest 5 percent royalty to NSTA. Although over a half million copies were sold, NSTA never recovered its own input costs of the project because the books were priced at only 50 cents with school discounts in quantity lots; our total royalty income during eight or nine years was less than $20,000. As with some of our other projects, however, we were satisfied that Vistas had demonstrated the worth of an idea and had been a significant service — "well worth the cost."

Other FSA Undertakings

Four more projects done under the banner of or closely related to the FSA program remain to be reported. Two of these were one-time operations, one fizzled completely (but an in-

teresting story nevertheless), and the fourth became a large, still-operative success.

On the Target

By the time 1956 arrived on the scene, the Cold War, "the critical shortage of scientific personnel," and criticism of the schools, of science teaching in particular, were reaching crescendo. Chief among the critics, insofar as national press was concerned, were Admiral Rickover (no further identification needed), Admiral Straus (head of the Atomic Energy Commission), and a Vice President of the United States named Richard M. Nixon. These men, plus numerous others, including several columnists, and magazine writers, who seemed to pick up and repeat the chant, told the American people that

"Half of all American high schools do not teach chemistry, physics, or advanced mathematics."

"Only 4 percent of American high school students take physics."

"Half the nation's high school science teachers are unqualified."

And other such things.

No group could have been more committed to the advancement and the improvement of science education in the schools at *all* levels, elementary through college, than was NSTA. We could accept many of the criticisms that were voiced, but we seethed at what we felt was repeated use of "the Big Lie" and tactics insulting to schools, teachers, and, yes, even students. We became determined to attempt to combat the falsehoods and to set the record straight.

With budget provided by FSAF and with much help from the NEA Research Division, in particular from its Director, Frank W. Hubbard, we produced a brochure titled *On the Target!* in which we tried to set forth the facts as regards science course offerings and enrollments in the high schools, science teacher supply and demand, and other such matters. Then, going beyond the defensive or corrective aspect of the document, we introduced a counter-offensive by identifying numerous needs of the schools, delineating several possibilities for achieving desired improvements, and issuing a call for the end of acrimony and the substitution of cooperative endeavor among concerned citizens, school people, business-industry, government, and professional scientists and engineers. *On the Target!* did indeed receive a warm reception; the feedback on this prob-

ably was greater and more complimentary than for any other single publication. Published as an insert in the April 1957 issue of *The Science Teacher*, we followed through by sending reprints to the editors of newspapers and magazines, members of the National Association of Science Writers, all incumbents in the U.S. House and Senate, the heads of numerous U.S. government agencies, several hundred business-industry contacts, and the executive directors of many scientific, engineering, and educational societies in quantity lots as requested for redistribution to their officers and key leaders. In all, approximately 50,000 copies went into circulation. We assumed on faith that *On the Target!* had reached the target and was having a beneficial effect in stimulating positive actions.

Science Island

From success with *On the Target!* to, well, if not failure, a fizzle with Science Island. It began in late 1957 when I received a caller from New Jersey. His story (boiled down considerably) was this: his 12-year old son had attended a summer science camp in Pennsylvania the previous summer; this experience was so tremendous that he, the father, wanted to reciprocate by doing something "really big" for science education; he owned about 90 percent of 110-acre Cushing Island in Casco Bay about three miles out from Portland, Maine (the other 10 percent having been used years ago to begin an aborted development of residential estates); on the island were several substantial buildings which had been constructed as officers' quarters, troop barracks, maintenance and service centers, and a guard house back in 1917 or so when the U.S. Army took over the island and fortified it as part of the World War I effort; he proposed to re-name the place Science Island and make it with all facilities the location of a continuing science summer camp for students and teachers. His big question was: Would NSTA be interested to have the island and be the operating agency for the summer camp program?

Now there was a proposition to make the adrenalin flow! As the pitch continued, my visitor extolled the tremendous potential of Science Island: too much so, perhaps, but I took the idea to the Executive Committee and they encouraged further exploration.

This continued throughout 1958. It turned out that turning Science Island over to NSTA as a gift in order to do "big things"

for science teaching was not quite the idea he had in mind. More precisely, Science Island was for sale — at a price of perhaps $125,000. A purchaser would be created by setting up a National Youth Science Foundation which would then solicit enough money from business-industry to buy the island. In turn, the foundation would rent the island to NSTA for $1 a year and "you're in business." No doubt all of these maneuvers could have been done with complete legality, but we began to develop signs of gun-shyness. Nevertheless ...

Still exploring (or gullible), President Herbert A. Smith and I drove to Portland, Maine to spend all day of January 23, 1959 tramping over Science Island through six inches of snow in 10°F weather (but bright and sunny) to inspect the terrain, the buildings, the cliffs, and the tunnels. I remember it well, every detail, because that is where and how I spent my 50th birthday anniversary; the highlight of which was the Maine lobsters we had for lunch. We had been joined by a vice-president and the chief legal counsel of Colby College (Waterville, Maine), which institution we had invited to consider becoming a co-sponsor or co-operator in any project that might emerge. As we had been told, Cushing was a beautiful island — the kind you might dream of having as your own refuge of escape. The cliffs and the upslope to them were a stunning example of the glacial activity in that part of the world 12,000 years ago. The buildings, all abandoned and standing empty, were sturdy brick on 3 × 3 × 8-foot foundation blocks of granite. We estimated that they would need 40 percent or more repairs and restoration. As for the prison with its eight 12 × 12 cells, I thought that except for the lack of ferryboat transportation from the mainland, it could be transformed into a successful "Jail House Restaurant."

About two weeks later, our Colby College friends reported that the records showed that the island had been acquired by the present owner as surplus property from the U.S. government a few years earlier; also, that unpaid property taxes for the intervening years had accumulated and the local government was somewhat restive. The Science Island proposal was not acted on by the 1959 Board, but at an Executive Committee meeting under President Donald G. Decker held the following October 8, a motion "that we eliminate the Cushing Island activity from all future consideration" passed unanimously. Perhaps two or three years later (I haven't checked to be more precise) a summer program for students was held on Science Island, conducted by a college in or near Portland with NSF support. I have heard

nothing more about Science Island since then and do not know its status today.

Whenever I think of the Science Island saga, I am reminded of one of my favorite down-east Maine stories.

"This morning," said Phil Perkins, "my wife Clara died. It was near zero, but I went out to the barn to make her a box. I hit my thumb with the hammer four times and split two tops before I got it made and her in it. I loaded Clara onto the wagon to take her into town, but the harness broke on one side and old Tom had to pull kinda like a dog on three legs. Going up that hill by the church, Clara slid off the back of the wagon and smashed right through the winda into Bert Sawyer's store."

"Did you get hurt, Bert?"

"Nope," said he. "Did you meet the undertaker?"

"Coming or going?"

"Going."

"Naw; musta missed 'im, I guess. I tell you, Bert; my day's been one long fizzle from beginning to end."

The U.S. Registry

The year was 1958. It had become quite evident that for the dissemination of FSA literature and other NSTA materials as well, the Association desperately needed communication with the nation's science teachers far beyond those enrolled as members. We were also being contacted for help in reaching U.S. science teachers with information about government programs such as NDEA and NSF offerings and about some of the offerings of business-industry such as upcoming science programs on commercial television. The answer to all these needs was, of course: develop a name mailing list of U.S. secondary school science teachers. The idea was soon extended to include mathematics teachers.

With an allocation of $3500 from FSAF and $11,900 from NSF, the first U.S. Registry of Secondary School Science and Mathematics Teaching Personnel was compiled and in use by the spring of 1959. The project had received prompt endorsement and cooperation of the National Council of Teachers of Mathematics and the National Association of Secondary-School Principals, which helped greatly to generate the amazing school response that we received. We had first to compile a mailing list of all secondary schools, which we did by melding the lists of USOE and NASSP. This resulted in a roster of approximately

35,000 schools and, of course, the best such mailing list in the United States. We sent to the principal of each school a letter outlining the purposes, scope, and nature of the proposed Registry and with it a response form for reporting the school's science and mathematics teachers by name, their respective teaching assignments, and a few other kinds of information. More than 70 percent of the schools responded, resulting in a first-round Registry of approximately 120,000 names. As the years went by (with the Registry still active in 1973-74), the response never dropped more than a point or two lower and in at least one peak year we got a 79 percent response. Along about 1968 the Registry was further expanded to include teachers of the social sciences (history, problems of democracy, civics, psychology), which meant that completing the report form was quite a chore for any given school; the larger schools were reporting as many as 30 to 35 teachers. The response percentage held up, however, and our total Registry contained as many as 300,000 teachers.

The Registry was made available to users on a cost-plus-overhead basis and in the form of printed mailing labels for one-time application by standard mailing-house machines. The Registry was computerized, of course, and all entries were coded so that we could supply mailing lists broken down precisely as almost any user might want — by States or even Zip Code areas and by about 30 categorical breakdowns such as department chairmen, biology teaching only, 7th-8th-9th grade teachers, earth science, chemistry-physics combination, physics-mathematics combination, and so on (and similarly for mathematics teachers and those in the social sciences). A copy or prospectus of what was proposed to be mailed had to accompany each order for Registry labels and if there was any question of its propriety or whether it met the Registry criterion of "for educational use only," a decision was reached through an evaluative conference of staff personnel from NSTA, NCTM, and NASSP.

The Registry became self-supporting within three or four years and was thereafter carried on as an internal project of the Association without support from either FSA or NSF. The U.S. Registry has been an outstanding success as a means of communication between teachers of science, mathematics, and the social sciences and countless companies, organizations, and agencies able and eager to help with the improvement of secondary school education.

Skylab

Among the high visibility (in the public eye) space projects of the National Aeronautics and Space Administration being planned to follow the spectacular walks on the moon, none outranked Skylab, scheduled to be launched early in 1973. Skylab was to be the first manned U.S. orbiting laboratory in which long-duration (171 days, 13 hours, and 17 minutes ...), manned investigations in weightlessness, astronomy above the earth's atmosphere, and large-area earth observations would be carried out. In early June of 1971, several representatives of NASA approached NSTA with an idea for a Skylab-related student project which they suggested we might be interested to administer. Briefly stated, the idea was that some number of research projects conceived and designed by high school students might be carried aloft by Skylab, there to be conducted by the crew and later reported in the manner of all NASA experiments.

The idea took root immediately and we moved into action in the customary manner. At a June 23-25 feasibility conference involving NASA personnel, NSTA staff and President-elect Ledbetter, and about a dozen Washington area science teachers, it was agreed that a Skylab Student Project that would meet generally accepted educational criteria could be designed. A central purpose was formulated: to stimulate student interest in science and technology by directly involving students in the space research program. The broad outlines were sketched for structural and administrative procedures based on the traditional NSTA practice of starting with regional competitions.

Specifics of the project were worked out later by a conference of designated regional chairmen, plus NASA and NSTA representatives. As for participation, recognition and awards:

- All students in grades 9-12 in all U.S. schools are eligible.
- Proposed projects may relate to any field of science or technology, but it is essential that they make use of the unique environment of Skylab; certain compatibility restraints imposed by Skylab are spelled out in the rules booklet. (NASA's first admonition was: "You must make use of Skylab; if your proposed experiment can be done on earth, forget it.")
- Entries must be proposals of no more than 1,000 words, plus necessary drawings, suggesting experiments to be conducted on Skylab.
- Entries must be sent to regional chairmen for judging by teams of scientists, engineers, and science teachers.
- Regional winners will be selected for further consideration in the selection of national winners.
- All regional winners, their teachers, and their schools will receive special certificates.

- All regional entrants other than winners will receive certificates of participation.
- 25 national winners will be selected; they and their teachers will receive Skylab Student Project medallions, and their schools will receive special display plaques.
- NASA representatives will select about five or six of the projects proposed by the national winners for inclusion among Skylab's experiments.
- The 25 national winners and their teachers will be convened at the Kennedy Space Center for an educational conference preceding the Skylab launch, all expenses paid by NASA, and will then witness the lift-off.

The Skylab Student Project epitomizes NSTA's concern that student science activities homogenize with normal or desirable school and classroom objectives and practices. They must not interfere, compete, or erode in a manner to defeat the ends of school science education. They can and should advance the pursuit of such desirable goals as independent study, the exercise of imagination and ingenuity, the release of creativity. Student "pats on the back" should provide recognition and encouragement for all who participate. The tangible awards should be significant in meaning, sufficiently but not overly numerous, and not necessarily lavish. Convincing evidence that the Skylab Student Project met the criteria and was warmly welcomed by schools, teachers, and students may be found among the wrap-up statistics:

- Nearly 4,000 regional submissions were sent in by students all across the nation.
- 300 entries were selected as regional winners and were sent to Washington for national judging.
- The quality of these 300 proposals was such that the national judges (mostly NASA scientific personnel) selected not only the promised 25 national winners but also 22 additional entries for National Honorable Mention.
- Moreover, the ideas inherent in the submissions were so good that instead of five or six, 19 proposals were selected to "fly with Skylab."
- The 25 national winners came from seventeen different states.

It seems safe to say of Skylab Student Project: mission complete, mission a success.

How does one conclude or do a wrap-up of a story like the one in this chapter? Nowhere among the early proposals and arguments for the formation of an NSTA did there appear any suggestion of such an extensive array of youth activities as the Association carried on for 20 years. Obviously, the officers and

leaders during this time were sensitive to emerging problems, needs, and desires — not only of teachers and the schools but societal as well. It is also obvious that numerous and diverse ideas were generated for helping with some of the p's, n's, and d's through the medium of youth science activities — and many of these were activated with Board of Directors approval and much external financial aid. Opportunistic? Certainly; how else? During these twenty years about forty different projects were undertaken, several of them one-time operations, others running two or three years, and a few enduring eight to ten years or more. However, only three projects (FSA clubs, the Registry, and Viking) and a few publications were alive as of 1974. Times change. At peak, NSTA had as many as six to ten youth-related endeavors going on at once, and such activities accounted for about 25 percent of the budget and perhaps the same fraction of total staff time.

As one thinks back over the years and ponders, the question is inescapable: How much of it all was useful and truly helpful; how much was mere spinning of the wheels? My own assessment would have to be that what NSTA did by way of youth activities over 20 years was definitely a contribution of highly significant value in relation to the reasons and purposes for doing it, an overall effort worthy of perhaps a 90 percent rating at least. It takes an orchestra of many instruments to play a great symphony. In "The Prelude to Future Scientists and Engineers," NSTA and many other groups were joined in the orchestration — and I do not think that our role was that of playing second fiddle. We can be proud of the music we contributed.

5

International Activities

The National Science Teachers Association was hardly dry behind the ears when it got its feet wet in international activities. Late in 1945, the Association received a request from Grayson Kefauver, then on leave from his position of Dean of the School of Education and Professor of Education at Stanford University, who, being in charge of the European Branch of Allied Ministers of Education in London, was heading up a special educational task group for the Division of Cultural Cooperation, U.S. Department of State. The request was for aid in preparing "a report on science teaching in the United States" in the belief that "such a report would be of value in the rehabilitation of schools destroyed during the war." The development of this project, the way in which it was carried out, and the overall nature of the end product can best be summed up quoting the following excerpts from letters exchanged during the ensuing several months.

My dear Dr. Johnson: May 4, 1946

I have noted from a letter of April 10, 1946, addressed to me by Dr. S.R. Powers, that ... a Committee of Scientists, in cooperation with the National Science Teachers Association and the Scientific Apparatus Makers of America have been at work on a statement describing courses in science taught in the high schools and colleges of the United States, and which will include for each course described, a list of equipment appropriate for use in teaching this course. This statement was planned as a possible aid to Ministers of Education ... of devastated countries whose educational institutions have suffered as a result of the war.

The Department of State will welcome receipt of this statement and it will be made available to the United States representative on the Preparatory Commission (for UNESCO) for appropriate action.

Sincerely yours,
William Benton
Assistant Secretary of State

Dear Dr. Johnson: July 1, 1946

I submit herewith the committee report on *Science Course Content and Teaching Apparatus Used in Schools and Colleges of the United States* ...

The report was prepared under the direction of a Central Committee ... Policies and general methods were developed by this Committee ... Sub-

committees prepared course outlines which were submitted to ... the Scientific Apparatus Makers of America, for assistance in the development of the initial Apparatus lists ... checked and revised by the sub-committees before final editing by the coordinator ... Mr. Ralph W. Lefler, Purdue University.

The (AAAS) Cooperative Committee on the Teaching of Science and Mathematics,... was asked (by NSTA) to act in an advisory capacity for the preparation of the secondary school part and to prepare the college portion of this report.

Sincerely yours,
S.R. Powers, Chairman

My dear Mr. Johnson: October 22, 1946

Your letter of August 20, 1946 to Mr. Benton was delivered to me ... together with the excellent report *Science Course Content and Teaching Apparatus Used in Schools and Colleges of the United States*.

I want to commend you and your organization for having done a truly comprehensive and most helpful job ... I have given a copy ... to Dr. Esther C. Brumauer, United States Representative to the Preparatory Commission of UNESCO ... Those in the Department who had the opportunity to look over this report have been impressed with its quality and usefulness.

Sincerely yours,
Charles A. Thomson, Adviser
Office of Information and
Cultural Affairs

United States Scientific Export Association, Inc. January 28, 1947
New York, New York

Dear Sirs:

The undersigned persons, who have been made responsible as a committee by their respective societies, hereby grant the United States Scientific Export Association the right to print and to distribute (overseas only) copies of a report prepared by the National Science Teachers Association with the cooperation of the Cooperative Committee ... of the American Association for the Advancement of Science ... The committee wishes you success in your efforts to make this report available to those of the United Nations who are desirous of using it.

Philip G. Johnson (NSTA)
S.R. Powers (NSTA)
K. Lark-Horovitz (Chairman, AAAS Cooperative Committee; NSTA)
Morris Meister (President, NSTA)
Ralph W. Lefler (Secretary, AAAS Cooperative Committee; NSTA)

This project was aided by financial support from the Scientific Apparatus Makers Association, and the W.M. Welch Manufacturing Company lithographed 2,000 copies of the final report, bound as a 186-page book, as another contribution to the project As guided and prepared by the Central Committee, the report drew heavily from the NEA Educational Policies Commission publication, *Education for All American Youth*. Following the Introductory Statement, separate sections of the report dealt with Elementary School Science, General Science,

and Biology, Chemistry, Physics, and Physical Science at the secondary school level. Representative coverage of college-level courses ranged from Astronomy to Zoology. The preparation of this report and its production and distribution, coming at a critical time in history, may well have been NSTA's most significant contribution among all Association activities at the international level.

There were a few other kinds of international activities more or less under the banner of NSTA during the early years. These, however, were sporadic, opportunistic, and uncoordinated. Numerous articles relating to "the War Effort" and to the anticipated aftermath appeared in *The Science Teacher* during, say, 1944-48, and since *TST* was the official journal of NSTA one might conclude that these were at least sanctioned by the Association. One Section of *TST* in particular — headed "Science For Society" and edited by Joseph Singerman of the New York City High School of Commerce — frequently raised issues and offered policy and action proposals of international concern; e.g., *For Defeat of Fascism*, October 1944; *International Scientific Cooperation*, February 1946; *Science For Freedom*, February 1947.

A late 1948 suggestion to the Board of Directors from Blanche Bobbitt, Director of Science, Los Angeles Public Schools, led to the formation of NSTA's first Committee on International Relations, with her as chairman. Six months later this committee reported at the 1949 Board of Directors meeting such ongoing activities as the preparation of UNESCO-related pamphlets for science teachers, correspondence between U.S. and foreign science teachers and science club sponsors, and projected cooperation with the science staff of the Paris headquarters office of UNESCO. One of the projects later developed into a brochure, *The 'S' in UNESCO*, which was summarized as "Science In UNESCO" in *TST*, November 1950. At this same 1949 meeting of the Board of Directors, Arthur O. Baker reported on having represented NSTA at a meeting of UNESCO held the previous March 31-April 2 in Cleveland, Ohio. Baker summarized 24 "significant problems" that had been discussed, including:

How can areas of overproduction of food be correlated with those of underproduction so as to reduce the amount of famine in the world?

How can the World Health Organization reduce suffering and combat disease throughout the world?

What conservation programs should be sponsored by UNESCO?

How can UNESCO bring science and technology to Latin American countries?

Baker summarized his personal evaluation of the conference in two statements: First, "There was a surfeit of idealism and little of the concrete in the discussions"; second, "The educational discussions were pointed almost exclusively toward the social studies." The Board of Directors listened but took no action. Six months later the Board listened to another report by its representative to a United Nations Conference on Conservation and Utilization of World Resources, and once again — no action.

These nonactions and implied attitudes of Boards of Directors characterized NSTA's stance on international relations activities throughout the decade of the 50s. True, each President appointed an International Relations Committee (with little or no financial support), and each year there was an annual report. But nothing of much consequence could be done, and hence there was little to report; no "big ideas" to be considered for NSTA action emerged. In truth, there was not much to write home about as regards international activities — not until the 1959-60 President, Donald G. Decker, instigated a new approach.

Science Study Tours

Soon after Decker became President, he appointed an *ad hoc* committee with the assignment to "carry out a year of exploratory efforts to sharpen the focus, increase the intensity, and improve the quality of NSTA activities at the international level." Thus was ushered in the decade of the 60s as a high-water period in NSTA's international activities.

The first "big" undertaking under the new impetus was NSTA's first Summer European Science Study Tour for Teachers. Planning for this got under way immediately, and we were able to make public announcement of the project in the December 1959 issue of *TST*. Principal purposes of the tour were listed as: (1) to meet and confer with our counterparts in science teaching in other countries; (2) to visit elementary and secondary schools, colleges, and universities; survey room designs and science teaching facilities; (3) to visit places and institutions of special scientific interest, historical or current; and (4) to do

some of the usual kinds of tourist sightseeing. On July 19, 1960, 34 teachers took off for the 40-day science study tour through 6 Western European countries.

It seems appropriate at this point to report some of the details of planning and conducting this tour, not only for possible intrinsic interest but because it became the model for the design of all teacher and student tours to follow. The architect, and later the tour director of this adventure was Abraham Raskin, Professor of Physiology and Coordinator of Science Teacher Education at Hunter College, New York City. He had served on several NSTA committees and was director of the STAR Awards programs of 1956, 1958, and 1960; he was an experienced "international traveler." Abe developed the initial itinerary, time schedule, and tentative list of conferences and visitations. Through an exchange of perhaps 200 letters with foreign correspondents, the final program emerged. The U.S. Department of State endorsed the tour and introduced us to the American Ambassadors in the countries to be visited; they in turn helped facilitate contacts and certain specific activities within the respective European countries. The operational aspects of the tour included these features:

- The tour was completely self-supporting through full payment of all costs by the participants; none of the expense accrued to NSTA.
- The tour director traveled with all expenses paid but no honorarium; an assistant tour director (usually) traveled at 50 percent of the total cost of the trip.
- The entire trip was planned by NSTA, although the NEA Travel Division and a commercial travel agency gave assistance in securing trans-Atlantic and continental transportation and making arrangements for hotels, meals, and most sightseeing.
- The commercial travel agency provided one free passage for each 15 "paying customers" in the group, thus enabling the tour director(s) to travel free or half-rate.

Members of the first summer tour accepted a commitment to share in writing a follow-up report, and the group was organized into about ten committees for this purpose. The complete report of 96 pages was duplicated and perhaps 200 copies were distributed to interested members who wrote in requesting them. A condensed version of the report was published in *TST* (May 1961, p. 21), revealing an astounding, almost unbelievable array of activities for a 40-day trip; e.g.,

- the group made 17 visits to places or institutions of special scientific interest, including the Scottish Poultry Research Center; the radiotelescope at Jodrell Bank, Cheshire, England; the National Institute for Research in Nuclear Science at Harwell, England; the Delta Plan and the Zuider Zee Reclamation Project in The Netherlands; the Deutsches Museum in Munich, West Germany; the World Health Organization in Geneva, Switzerland; the Center for European Nuclear Research in Meyrin, Switzerland; and the Pasteur Institute in Paris and the Joliot-Curie Laboratories at Centre d'Orsay, France.
- the group visited eight schools and colleges in England, Switzerland, and West Germany such as Winchester College (a secondary school) in England; Kingsdale School (a comprehensive secondary school) in London; Ludwig Oberrealschule and Gymnasium in Munich; and the College de Genève, Geneva, Switzerland.
- The group participated in eight conferences and seminars (and taped all proceedings), examples being with a group of science teachers and headmasters in Edinburgh, Scotland; the Permanent Conference of Ministers of Culture, Bonn, West Germany; Swiss teachers of science, Geneva; UNESCO science staff, Paris; and at the Institute Pedagogique Nationale in Paris
- the group still found time for sightseeing and social activities such as seeing Stonehenge and the head of the Rhone Glacier, having tea at the home of the U.S. Consul General in Edinburgh, a social gathering with the U.S. Science Attaché at Bonn, and going on a Rhine River boat excursion.

Two more Summer European Science Study Tours were carried out during the next four years, but by 1965 the program had run out of steam. A proposed 1965 tour offering attracted only about half a dozen applicants and that was the last attempt to keep this program alive. There was, however, a derivative activity of considerable significance which began in 1961 and has continued to this day; namely NSTA representation at the Annual Meetings of the Association for Science Education of Great Britain.

Aided by a grant of $2500 from the National Science Foundation, the first NSTA delegation to a meeting of our counterpart British organization traveled to Glasgow, Scotland, January 1, 1961 for the meeting and then, five days later, went to London for another ten days of school visits and conferences. It was the

Annual Meeting of the Science Masters' Association (SMA) that we attended at the University of Glasgow. In those days, male and female science teachers of England, Wales, Scotland, and North Ireland were organized separately into SMA and the Association of Women Science Teachers. The two groups merged in January 1963 to form the present Association for Science Education (ASE).

The information, impressions, and inspirations gained by the Americans at Glasgow were summarized in an eight-page report published in the May 1961, issue of *TST* (p. 10) as a means of sharing this fruit with NSTA members and other readers of the journal.

The experiences and contacts of Glasgow soon led to a continuing exchange of representation between NSTA and ASE at the respective annual conventions of the two associations. The general plan has been that two visiting delegates would cover their own trans-Atlantic travel expense and the host organization then welcomes the visitors as guests for housing and meals for the duration of the convention. On occasions the ASE delegates have extended their U.S. visit by a week or ten days for travel to two or three cities, usually the locations of universities they wished to visit, where they were house guests of NSTA members who served as hosts and guides. The official delegations of the two societies usually consisted of the President (called Annual Meeting Chairman by ASE), the Executive Secretary, and/or another officer.

The NSTA delegation to ASE on several occasions was augmented by 15 to 30 other science teachers who joined a planned tour to visit the ASE meeting and enjoy an additional 10 to 15 days of year-end Holiday European sightseeing. Such groups attended ASE meetings in Nottingham, London, Bristol, Cambridge, and Brighton. The usual stopovers on the continent included Amsterdam, Paris, Madrid, and Lisbon. The 1970 tour was the last of this kind, however, primarily because the dates of the ASE meetings were shifted from the three or four days preceding New Year's until afterward. American teachers had to be back in their classrooms on January 2 or 3 and thus the new ASE dates precluded the assembly of the required size tour group. Officers of the two associations have, however, continued the annual exchange.

The Association's annual delegations to the London International Youth Science Fortnight were, of course, an international activity as well as part of our youth activities program.

Already reported in Chapter 4, these excursions closely resembled the adult tours of teachers to ASE. Perhaps the most revealing report as to the nature of IYSF and of the other activities engaged in by the students appeared as an article in *TST*, December 1964.

WCOTP Relations

It was the NSTA headquarters location in the NEA building that gave us the contacts leading to several activities in cooperation with the World Confederation of Organizations of the Teaching Profession (WCOTP). This organization, formed in 1952, was somewhat of a United Nations of the teaching profession. It was comprised of more than one hundred member organizations from seventy or more countries, but only from the non-Communist countries. William G. Carr, the Executive Secretary of NEA, also served as Secretary General of WCOTP.

WCOTP through earlier years had established continuing committees in five or six areas of curriculum and instruction and at least two of these — music and health-physical education — had evolved into international organizations for their respective fields. NSTA urged the NEA International Relations Committee staff and the Washington WCOTP staff to prod WCOTP into doing something similar for science. This goal was achieved when WCOTP at its 1961 annual General Assembly authorized a Specialized Committee on Science Teaching and provided a modest budget allocation in support thereof. NSTA was invited to be represented on this committee. Simultaneously, we were asked by NEA to provide one person to serve as a member of the total NEA delegation to the WCOTP General Assembly and another person to serve as observer and alternate, beginning in 1962.

Our inclusion in the NEA delegation to WCOTP was short-lived and, from the selfish NSTA point of view, not very productive. Each WCOTP General Assembly carried a general theme which was pursued through prepared working papers, study and discussion groups, plenary sessions, major speakers, and the adoption of resolutions. NSTA members of the NEA delegations participated in these activities as effectively as any other delegates, but there was little to bring back for action consideration by NSTA. Most of the resolutions related to the kinds of concerns that engage the general educational organiza-

tions, such as NEA, rather than the specialized subject-matter groups.

We continued our involvement for six years before terminating after the 1967 meeting. During the interim, NSTA was represented at Stockholm (1962) and at Rio de Janeiro (1963) by Abraham Raskin; by Stanley E. Williamson at Paris (1964), by Helen E. Hale at Addis Ababa (1965), by James V. DeRose at Seoul (1966), and by Addison E. Lee at Jamaica (1967).

The WCOTP Specialized Committee on Science Teaching, on the other hand, was an activity which we could share with enthusiasm, and we did. The organizing meeting of this committee was held at Stockholm in 1962. Abe Raskin had been named as the American member of the committee and since I had accompanied him as alternate-observer to WCOTP, both of us participated with the science committee. Purposes of the committee as posed by WCOTP were (to promote):

- exchanges of information, especially in regard to curriculum content, methods, and trends in science teaching.
- increased cooperation among science teachers and their specialist associations.
- comparative international studies and projects.

The committee promptly added a fourth purpose:

- improvement in the preparation of teachers.

Work sessions of the committee were open to attendance by all WCOTP delegates and local area teachers interested in science. About forty such persons were present at the Stockholm meeting; they entered into the discussions and their ideas helped shape the action proposals of the initial Specialized Committee on Science Teaching. Three of the committee's proposals were authorized by the WCOTP Executive Committee for 1962-63 (later extended to 1963-64):

- The compilation of a list of educational organizations devoted to or interested in science teaching, country by country
- A questionnaire study of the conditions for science teaching with special emphasis on materials and teacher preparation
- A compilation of information on school science programs in the 73 member countries of WCOTP, especially in regard to new methods and techniques

The Executive took "under advisement" a fourth proposal:

- To investigate the possibility of international regional meetings in science education

and rejected as "premature" a request that

- the Specialized Committee be empowered to take practical steps to promote the formation of an International Council for Science Education affiliated with WCOTP.

Raskin was commissioned to carry out the three authorized tasks, and NSTA headquarters was designated as the secretariat for handling the correspondence and other leg work involved. After Raskin's untimely death in April 1964, President Stanley E. Williamson took over the work of completing the studies and reporting to the science committee and WCOTP at Paris the following summer. Reports of two finished studies of facilities and teacher education were turned over to the WCOTP Executive Committee (other work was reported as "in progress"), but we never learned of any use or distribution made of them. After one more year, the Specialized Committee on Science Teaching was abolished by WCOTP.

Before the science committee was terminated, however, one international regional conference in science education was held under its banner. This was a Conference for Science Specialists of Southeast Asia, convened December 5-11, 1964, in Manila, The Philippines. WCOTP seemed solidly behind this project and allocated perhaps $10,000 to support it. The planning operations were carried on by the Washington office of WCOTP and, therefore, I was consulted frequently and was also invited to attend as representative of the science committee's secretariat. The conference brought together about thirty delegates from fourteen different countries including Australia, which is hardly "Asiatic." Our hosts put on a wonderful array of visits to schools, colleges, Philippine scientific research and development centers, and social activities. In plenary and subcommittee work sessions the conferees grappled with five aspects of science education in primary and secondary schools, in the end turning out a five-part report summarizing their identification of problems, needs, and recommendations.

NSTA was a participant organization in two more conferences sponsored by the NEA International Relations Committee with WCOTP "blessings" in later years, even though we had by then withdrawn from taking part in the NEA delegations to the WCOTP summer General Assemblies. These conferences were known as International Curriculum Conferences but actually involved only the "ABC countries" — America, Britain, and Canada. Our first invitation to provide representation was for the Third International Curriculum Conference, held in September 1967, at the University of Oxford in England. This con-

ference was designed, in part, to focus quite specifically on subject-matter areas of the curriculum, and NSTA was authorized to send three delegates to work, respectively, with groups devoted to primary (elementary) school science, middle and junior high school science, and secondary (senior high) school science. Our delegation believed the conference to be productive and quite worthwhile. Two years later, however, at the fourth ABC conference, the outcomes seemed to be vague, nebulous, and quite distant from the realities of classroom teaching. Perhaps this was inevitable since the Fourth International Curriculum Conference, held at New Paltz, New York, had as its theme "Values, Value Systems, and Education," an important but difficult concern to make concrete. This Fourth was the last of the ABC conferences — and also NSTA's last link with WCOTP.

UNESCO Relations

The Association's first direct connection with UNESCO was established in 1964. At the request of the Committee on International Activities, we sent a letter to the office of the U.S. National Commission for UNESCO asking for information on how we might become affiliated, what our responsibilities would be, and other related questions. In reply came this: "Your inquiry of March 12 ... came at a most opportune time. The Committee on Membership, which met a few weeks ago, noted the importance of science education in the UNESCO program and decided to recommend to the Commission that the National Science Teachers Association be invited to nominate a member."

The official invitation followed soon afterward, which the Board of Directors accepted during its July 1964 annual business meeting. As requested, in-coming President Helen Hale submitted three nominees for consideration by UNESCO to be the NSTA representative, the reason for this step being to give the Commission some latitude in choosing so as to help "balance" the experience, qualifications, and communication contacts of its members. Secretary of State Dean Rusk said in his letter of appointment to John S. Richardson, "I hope that, as you become acquainted with the work of UNESCO, you will report its activities to your organization and will inform us periodically of activities of your organization which are related to UNESCO's programs."

Richardson's appointment was for a three-year term, 1964-67, and was renewed for a second such term through 1970, cut short by his death in May 1969. James V. DeRose was invited by UNESCO to finish out this term and then was appointed to two successive three-year terms 1970 through 1976. NSTA still has the distinction of having provided, in the person of DeRose, the only high school teacher ever to serve on the U.S. National Commission for UNESCO.

In addition to sharing in discussions and decision-making on national policies and programs of the U.S. Commission, both Richardson and DeRose meticulously carried out the original request of Secretary Rusk for mutual reporting between NSTA and UNESCO. They prepared special articles each year for publication in *TST* and helped generate numerous reports and articles from other sources which appeared in *S and C* and *JCST* from time to time as well as in *TST*. Thus NSTA's reach with UNESCO and related international information was extended through the circulation of more than 50,000 copies of the three journals. Through stimulation by our UNESCO representatives and the Committee on International Activities, practically every NSTA national convention included not one but several "international" activities and program items — ranging from major addresses by foreign dignitaries to panels and discussions on science education in other countries to receptions for visiting science teachers from beyond the United States. Much of the journal reporting and many of the convention sessions involved U.S. science educators, of which there were several hundred, who had served abroad in various government and NGO (non-governmental organization) programs.

In turn, both Richardson and DeRose reported that they were pleased and proud to be able to report to UNESCO the wide array of NSTA's international activities and the consistency and intensity of the pursuit thereof, definitely putting us, they said, in "upper echelon" among the member organizations on the Commission. Perhaps the conclusion to be drawn from this is that internationalism had and probably still has a rather tough road to travel. Certain it is that in interest surveys of the readership of Association journals, "international science education" seldom ranked more than two or three steps from the bottom on a ladder of, say, 10 topical areas. International activities always had strong support among Boards of Directors, however, and so we persisted as best we could.

There was one other cooperative endeavor with UNESCO that has achieved outstanding significance; namely, the publication in 1956 of the *UNESCO Source Book for Science Teaching*. Soon after World War II (1948), UNESCO had published a volume of *Suggestions for Science Teachers in Devastated Countries*, prepared by J.P. Stephenson of the City of London School. With this volume as the starting point, the 1956 *UNESCO Source Book* was compiled in completely rewritten form under the direction of Ellsworth S. Obourn, U.S. Office of Education. The new work included additional USA material from the New York State Department of Education publications, *The General Science Handbook*, Volumes I and II; two USOE Bulletins on teaching elementary science (authored by Glenn O. Blough and Paul Blackwood); and NSTA's seven volumes in the Science Teaching Today series (the so-called Bruce Books). Our principal contribution to the project was the granting of full permission to UNESCO to select, revise, adapt, and use any or all content from the seven volumes without royalty or other financial returns, an arrangement in which Guy V. Bruce heartily concurred. The *Source Book* has by now gone through at least two subsequent revisions, the latest edition being 1973, and has been translated and published in 30 different languages; over one million copies have been sold.

Miscellaneous Activities

Numerous opportunities emerged over the years for NSTA to contribute to specific international projects on a one-time basis and to participate in certain activities or programs of longer duration. As examples of the former,

Associate Executive Secretary Albert F. Eiss attended an international symposium on science education research and development held in October 1970, at the University of Kiel, West Germany, under sponsorship of the Volkswagen Foundation. He made a presentation on "Educational Technology and Science Education"; afterward he met with faculty and students at a teachers college in Schwabisch-Gmund for a discussion of "Science Teaching in the Schools of America," then visited with the science staff of the Paris UNESCO Headquarters.

In late August 1970, Retiring President Alfred B. Garrett, by invitation and at the expense of the Australian Science Teachers Association, attended the annual meeting of ASTA in Tasmania and gave the keynote address, discussing the opportunities and

responsibilities of science teachers around the world to help achieve "peace, intellectual development, and cooperation that characterize The World We Want" (an adaptation of the theme of NSTA's 1970 national convention). A report of his travels and observations appeared in *TST*, January 1971, p. 17.

An NSTA delegation headed by Assistant Executive Secretary Dorothy K. Culbert attended the 1969 meeting in Brussels, Belgium, of the International Coordinating Committee for the Presentation of Science and the Development of Out-of-School Scientific Activities (ICC). ICC was recognized and largely supported by UNESCO. Culbert had attended the 1968 ICC meeting in Madrid, Spain, and NSTA later enrolled as a member organization. The NSTA delegation to Brussels noted that "the ICC representatives were strongly of the opinion that this task (the spread of scientific literacy among the general populace) will never be accomplished through the formal curriculum and, therefore, we must turn seriously to out-of-school activities (such as science clubs and fairs). Unimpressed by their experiences at ICC, the delegation did *not* recommend continued participation and thereby terminated NSTA's two-year membership in the organization.

Two international science study tours that never materialized could, nevertheless, be included among NSTA's one-time efforts at international activities. The first of these was developed to complement NSTA's participation in a Congress on the Integration of Science Teaching scheduled for September 11-19, 1968 in Varna, Bulgaria. Organized by a special commission of the International Council of Scientific Unions, the conference was to involve 100 or more representatives from about 30 countries, including the USSR and other East European countries. NSTA's four-member official delegation was to be augmented by about a dozen additional persons who, prior to the Varna Congress, would make stopovers in Western Europe for school and college visits and conferences with Ministry of Education personnel and others in science education. The plan was to merge this group and the Varna delegates after the congress and have them continue the visits and conferences in several Eastern European countries — Bulgaria, Romania, Hungary, Yugoslavia, and Czechoslovakia. Two of our delegates were to go on to the USSR for a 10-day visit. However, only a couple of weeks before the scheduled departure the tour was aborted by the Russian incursion into Czechoslovakia. One of our delegates, F. James Rutherford, and Marjorie Gardner "on her own"

did attend the Varna congress and reported no discernible impact on the meeting of the Russian action.

The second abortion was of a study tour to the Peoples Republic (PRC) of China. The NEA Division of Educational Travel had been trying during 1970-71 to negotiate permission to send some U.S. educational groups to the PRC, and suddenly about mid-June of 1971 it appeared that the door was going to open — also, that the first delegation to be accepted should be from the field of science. A call and invitation to NSTA to assemble a delegation of about 30 representatives from elementary level to college, from technical schools, and from many aspects of science education, coupled with an indication of need for haste, plunged us into a month of feverish activity to find a representative group of persons able to travel at their own expense. By early August the group was firm, was organized into committee groups (with Arnold B. Grobman of BSCS fame as overall chairman), and, in a word, was set to go, but in the end the trip never materialized.

In the category of activities that had a greater span of longevity, two seem worthy of mention. First to be reviewed was what we called a Clearinghouse for Overseas Teaching Positions, and the second was continuous role-playing as host to visiting science teachers and science education groups from other countries.

Our Clearinghouse operation was in force during eight to ten years of peak demand for U.S. science teachers to serve in other countries (about 1964-70). Usually the teachers served as members of teams assembled by agencies such as the Peace Corps, AID, Ford Foundation, and the Overseas Branch of the U.S. Office of Education. Teachers interested in such assignments "registered" with the NSTA office by filling out a personal data form that had been prepared with cooperation of USOE so as to include basic information the agencies would want to know early. These forms were coded and organized into a reference file at headquarters. When an agency aware of our file began a search for specified kinds of science teaching personnel, it would commonly send us a listing of the positions to be filled and the optimum requirements for each. We would then go through our file and pull out the record sheets of those registrants who seemed to be reasonably qualified. These we would send to the agency, and from then on any and all follow-up was between the agency and the registrants. On the average, we had about 150 registrants in our file at any one time, and

generally we would find perhaps two to five promising candidates for 50 percent or so of the posts to be filled. How many teachers from the Clearinghouse actually ended up overseas is a question that cannot be answered; probably no more than half a dozen such ever identified themselves to us.

To the best of memory and from checking the records, the first visiting science educator from abroad to call on NSTA for help in arranging a tour of the United States was Jan Koning of the University of Amsterdam, The Netherlands. He and his wife, Ini, were planning to come over here in late summer 1949 for a stay of about three months, and the purpose of the mission was to visit schools and colleges and confer with science teachers and professors of science education in the United States. A Dutch Foundation grant would cover trans-Atlantic transportation, and the Konings would (and did!) arrive with about $200 in pocket, the maximum exchange allowed to be taken out of their country at the time. Getting acquainted with them upon arrival in Washington, it came out that Koning had been a professor of chemistry before the war, had escaped conscription during the Nazi occupation, was in the Dutch underground, and what stories he told! During the occupation years he had given much time to teaching and working with Dutch teen-agers. He thus became converted to science education. After the war he resumed teaching at the University but as professor of pedagogy in science. His mission to the United States was for the purpose of enlarging his grasp and competence for his new field of endeavor.

As the post-war years gradually changed toward normalcy, increasing numbers of visiting groups of foreign science teachers began to arrive in the United States — and in Washington — and at NSTA. Whereas the earlier individual visitors had come mostly from European nations, Australia, and New Zealand, the later groups came from Japan, Taiwan, Korea, and the emerging African nations. They usually spent about a week in Washington for conferences with NSF, Science Service, USOE, NSTA, and other Washington-based groups. In addition to three or four NSTA staff members, the conference groups commonly included two or three classroom teachers from the D.C. metropolitan area and a few representatives from NABT, ACS, AAAS, and other such groups that our foreign guests did not visit separately. Always, of course, there was much handout literature from the host group for our visitors and much

picture-taking. In all, these get-togethers were very pleasant occasions and seemingly very helpful to the visiting groups.

One "must-visit" stop-over for practically all individuals and groups coming to Washington was the Science Teaching Center at the University of Maryland, about sixteen miles from downtown Washington, with which NSTA worked very closely. Under the direction and administration of J. David Lockard, Glenn O. Blough, and Marjorie Gardner (she went on the faculty there when she resigned from NSTA in 1963), the Center was also the location of Lockard's annual International Clearinghouse for Science and Mathematics Curriculum Projects and of NSTA's Science Teaching Materials Review Committee. This committee was located at Maryland beginning in September 1963, and has continued there ever since, reviewing books, films, and other science teaching materials for both *TST* and *S and C*. Since most materials submitted for review by publishers and other suppliers were retained at the Center, and since the Clearinghouse project brought in curriculum materials from all over the world, the University of Maryland Science Teaching Center was probably the best-equipped in the United States, at least with respect to curriculum and instructional materials. Nearly all of our foreign visitors wanted to see it, and we gladly provided private car or bus transportation to enable them to do so.

In at least four instances at the international level, NSTA received calls for help from a governmental or international agency. We were invited to early planning sessions for the International Years of the Quiet Sun (see *TST*, May 1963, p. 6), the International Biological Program (*TST*, December 1968, p. 21), International Cooperation Year (*TST*, December 1964, p. 16), and the International Geophysical Year (*TST*, October 1958, p. 311). Obviously, our contacts with these projects produced informative articles for *TST*, but except for IGY, the activities of the programs did not include direct approaches to or materials intended for schools. In the IGY endeavor, however, school-use materials were an important part of the total U.S. effort. Because of our proximity to the National Academy of Sciences, which spearheaded the U.S. program, NSTA was consulted frequently during 1957-58; including pulling together small groups of area science teachers to review proposals or early drafts of films and charts on two or three occasions. The director of the U.S. IGY program, Hugh Odishaw, joined the Association, and served on a couple of committees.

From the selfish point of view of the science teaching profession itself, the capstone development and the culmination of a 10-year dream came about in 1973 when the International Council of Associations for Science Education (ICASE) was organized. The idea of such an organization was first proposed seriously at the 1962 Stockholm meeting of the WCOTP Specialized Committee on Science Teaching, but got nowhere. The idea had been revived and carried forward during 1972 chiefly through the efforts of three persons: Dennis G. Chisman, Deputy Director, Education Projects Department, The British Council; Sheila Haggis of the Paris UNESCO office; and J. David Lockard, Science Teaching Center, University of Maryland. Plans moved ahead favorably to the point that an organizing conference was set up for April 1973, at the University of Maryland, immediately following the NSTA national convention in Detroit. In anticipation of a successful conference, the NSTA Board approved participation in the conference, named Elaine Ledbetter as the Association's representative, and authorized her to use her own judgment about committing NSTA to membership in any international organization that might be formed.

The conference was held, ICASE was formed, and Elaine did commit NSTA to membership for at least one year. There were representatives from 25 organizations from 19 countries at the meeting. Lockard was elected interim President of ICASE for its fledgling year, and Ledbetter was named to be the North American regional member of the Executive Committee. ICASE was a going concern, but where and how far it would go remained to be seen. Just as was NSTA 30 years earlier, ICASE in 1974 was only a babe in arms with its history still ahead of it.

There you have it, the story of NSTA's international adventures during 1944-74. What mark was earned? Considering our limited resources of personnel and money, how about A+ for "Effort"? Certainly a large number of diverse projects and activities were entered in the record, and in totality they bulk rather large, even when compared to other categories of activities more closely related to NSTA's central purposes. As for impact and significance, we probably never expected to send shock waves around the world. Considering the goals and realistic expectations of our international endeavors, how about B+ for "Achievement"?

6

In Cooperation With

Enough examples of NSTA projects and activities carried on in collaboration with other groups have already been cited to show clearly that the Association from its very beginning was much inclined to undertake such endeavors "in cooperation with" or "with cooperation of" a large variety of agencies and organizations. NSTA has never been committed to a go-it-alone policy. There were, no doubt, several reasons for this attitude:

- A felt need for moral support and financial help in building and strengthening the Association, particularly during the first half dozen years or so of its existence
- A recognition that cooperating organizations usually could add materially to the human and financial resources available to specific projects
- The recognition or at least the hope that cooperating organizations could increase substantially the reach and impact of the outcomes of the various projects, thereby enhancing the service role, recognition, and prestige of the Association
- A strong belief in interdisciplinary approaches in education and in team efforts as approaches to the solution of problems, a rejection of the notion of science as a watertight curriculum compartment and of the view of "classroom teachers" on one side of the fence opposed to supervisors and administrators on the other
- A sincere desire for work with other groups and lend assistance in the course of their undertakings when compatible with the goals and purposes of NSTA and provided the integrity of the Association was not endangered thereby.

During the 30 years of NSTA 1944-74, dozens of other organizations shared in the promotion and conduct of NSTA activities, and we, in turn, frequently gave support and assistance in theirs. The bulk of these cooperative endeavors involved the NEA, the Departments of NEA (most of them inde-

pendent organizations like NSTA), the business-industry community, science teacher organizations affiliated with NSTA, and such federal government agencies as the U.S. Office of Education, the National Science Foundation, and some of the National Institutes of Health. My purpose in this chapter, at the risk of some repetition, is to review and bring into sharper focus the many productive efforts of NSTA which "without support and cooperation" would never have materialized. Let us begin with NSTA's two "parent organizations," the AAAS and the NEA.

Relations with AAAS

Although the AAAS was supportive of the efforts that led to the formation of NSTA, there was no help at all of the kind that NEA provided for 15 years. Moreover, relations between NSTA and AAAS never produced any cooperative projects and no joint endeavors of much significance. The Cooperative Committee on the Teaching of Science and Mathematics was formed under the banner of AAAS in 1942, and NSTA became a member organization in 1946, but even so the Cooperative Committee was essentially independent and not truly a part or an arm of AAAS. This fact was made abundantly clear in 1970 when AAAS "blessings" and modest financial support (probably never more than $1,000 a year) for the committee were withdrawn, which left the struggling committee almost penniless and in search of a new sponsor or "home-base" organization. Shortly thereafter, the Committee just quietly breathed its last and expired.

Since there were several science teaching societies affiliated with AAAS, it is quite understandable that neither NSTA nor any other one could be singled out for what would at least appear to be favored treatment, whether financial aid, project involvement, or even advisory roles on AAAS committees and commissions. It was through these societies, as a matter of fact, that the maximum display of cooperation with AAAS emerged. Some of the societies, including NSTA, had been scheduling meetings for their members and other interested persons as part of the total AAAS annual meeting.

For the 1948 meeting in Washington on the occasion of the 100th anniversary of the founding of AAAS, the societies were persuaded to develop a single, coordinated meeting of the Science Teaching Societies of the AAAS with some sessions jointly

sponsored and others planned for the respective groups, all sessions focused upon a common theme. This plan continued in operation for 14 years. Participating in these joint meetings were the American Nature Study Society, the National Association of Biology Teachers, the National Association for Research in Science Teaching, NSTA, and, on occasion, the Central Association of Science and Mathematics Teachers, and one or two other groups. AAAS enthusiasm and support for these meetings gradually dwindled, however, and by 1960 or thereabouts, the societies were being charged for page space in the AAAS printed program, for use of audio-visual facilities, and for the use of some kinds of meeting rooms. Additionally, the meetings were poorly attended, seldom drawing more than about 300 identifiable registrants. The last of these joint meetings was held in 1961.

In 1955 the AAAS received a grant of $320,000 from the Carnegie Corporation (a foundation) to cover a three-year launching period for a project called Science Teaching Emergency Program (STEP). This project had been developed by the Cooperative Committee, but was adopted and made operational by the AAAS. In my Annual Report of the Executive Secretary to the NSTA Board of Directors (June 21, 1955), I said:

> All of you have received copies of the Minutes of the Cooperative Committee (meeting of February 25-26, 1955) ... giving the background, development, and definition of the Science Teaching Emergency Program (STEP) which was adopted by the AAAS Board as its own aid program ... While we have no formal request from AAAS to evaluate or comment on the program, both Dr. Wolfle and Dr. Behnke (Administrative Secretary and Associate Administrative Secretary, respectively, of AAAS) have said that any NSTA comments would be welcome and both have expressed intention and hope that NSTA will cooperate in making STEP a successful effort.

Later named Science Teaching Improvement Program (STIP), the project continued for six years, and from it emerged a continuing Office of Director of Education with budget and staff at AAAS headquarters in Washington. Dr. John R. Mayor, Professor of Mathematics Education at the University of Wisconsin, was named Director of Education, and he continued in this position until retirement in early 1974. NSTA was not asked to assess STIP in any way, and we proffered no free-will advice. Occasional reports of STIP were published in *TST*. There was, however, concern bordering on consternation among members of the NSTA Board of Directors that STIP seemed to duplicate several endeavors of NSTA, particularly within the newly estab-

lished FSAF, and loomed as a possible competitor for financial support from external sources; also, that here was still another "national organization," along with NSTA, FSAF, Science Service, NSF, USOE, and the National Academy of Sciences making direct, independent approaches to teachers, schools, colleges, and universities. As the basis for this concern, consider the major purposes of STIP as set forth by the Cooperative Committee (with a sampling of proposed subordinate activities):

- To encourage departments of science and mathematics in colleges and universities to accept the training of secondary teachers as a major responsibility
  encourage competent students to enter the teaching profession
  sponsor and support meetings and conferences for teachers
- To assist in the recruitment and training for teaching of individuals with the necessary subject matter competence but without the work in professional education required for certification
  encourage the planning of emergency programs and cooperative arrangements in colleges and universities
  encourage an intensive one-semester program of professional education for last semester seniors and recent graduates who meet subject matter certification requirements
- To assist in interesting high school students in preparation for teaching careers in science and mathematics
  create appropriate guidance materials on teaching
  distribute guidance materials to teachers, counselors, and students
  increase support of Junior Academies of Science, the Junior Scientists Assembly, and science fairs, science clubs, science congresses, and science project work
- To support higher salaries for (science and mathematics) teachers
  give widespread publicity to the special problems in the recruitment and retention of science and mathematics teachers because of the competition with industry and government
  study various ways of making science teaching more attractive through ... summer employment in science-related industries ... additional pay for directing student research projects, science clubs, science fairs
- To promote improved working conditions for and increased efficiency of secondary school teachers of science and mathematics
- To provide for the recognition of exceptionally able teachers through a AAAS program of awards for Distinguished Service Teacher citations
- To promote the selection and utilization of consultants in mathematics and science on an experimental basis in selected geographic areas [this turned out to be the largest and most visible component of all STIP endeavors].

The AAAS established a Commission on Science Education in 1965 and, in due course, obtained financial grants that enabled the development and later the commercial publication of *Science – A Process Approach*. NSTA was not involved with either the Commission or the project, although some individual members did serve in both. NSTA treated the project as we did any and all other curriculum development projects, providing pages

for reporting in *Science and Children*, exhibit space at conventions, and program participation opportunities at conventions. The AAAS Commission functioned for 12 years until officially terminated by AAAS in 1974.

So much for NSTA-AAAS relations — perhaps cool but not antagonistic; generally supportive but sometimes competitive; probably "cordial and warm" at best. Our offices being only about two blocks apart, staff members could confer conveniently and frequently did, and such talks were doubtless of mutual value. Similarly, we frequently exchanged staff conferences with many of the other Washington-based organizations involved in science education, but it proved difficult to generate common meetings of such staff representation for the purpose of exchanging information and ideas, although NSTA made the effort.

Relations with NEA

NSTA's relations with the National Education Association were about as wide-ranging as possible over the full spectrum from paternal and financial support during the founding years (1935-48) to physical separation and an operational separation by 1974. As already reported, NEA assistance during the transition of the old Department of Science Instruction into the National Science Teachers Association and in the establishment of staff and a Washington headquarters office was of inestimable value. Other organizations received similar treatment, of course, and the NEA consortium at 1201 Sixteenth St., N.W., soon included approximately twenty NSTA-like groups enrolled as Departments of NEA. This "big family" atmosphere persisted for about 20 years.

During the heyday of NEA-Departmental cooperation, three major undertakings were attempted, although none developed into a viable, continuing activity. Hence they can be reviewed and dismissed with relatively few words. Still another working relationship involved only NEA and NSTA, but that review will take a bit more space.

The idea of an NEA Council on Instruction was conceived in 1957, was pondered for a year by an Exploratory Committee on Instructional Service, and was developed into a specific proposal for action in May 1958 — a grandiose idea that was doomed from the outset as a forlorn hope. The "father" of the thought seems to have been Lyle W. Ashby, NEA Assistant Executive

Secretary for Educational Services (which included "Departmental Relations"). In support of Ashby's notions, the Exploratory Committee recommended the formation of a Council on Instruction in which all Departments, along with NEA itself and certain of its units, could have participating membership. The central purpose was to bring these groups together in common or coordinated action on educational problems of general concern to all. It was proposed that NEA provide necessary staff to maintain the Council as an operating agency and that Council activities be funded by NEA for one year, after which operational costs would be supplemented by contributions from constituent units. Grants from external sources to underwrite special projects were envisaged, and it was promised that "in dealing with problems of general concern to all members of the Council, it will seek to utilize the competencies of specialized units; in dealing with important problems of specialized concern, the Council will recommend action on such specialized problems by the specialized units, and may offer assistance where desired." The proposal was weak and unrealistic, and the Council never came into being.

However, the idea of highlighting NEA's concern and services in the realm of curriculum and instruction (the professional vs. the welfare) became the basis for establishing the NEA Center for the Study of Instruction a year or so later. Departments were invited to cooperate with the Center, submit proposals for joint projects, and otherwise participate in its activities. Very little such activity developed, however, and the Center was essentially an NEA operation. NSTA's only involvement with the Center was through the latter's role in generating American representation to the ABC International Curriculum Conferences in Oxford, England, and New Paltz, New York.

As of January 1960, NSTA joined with 19 other professional organizations, including NEA, to form a Council for Research in Education. Stated purposes were: to advance the standards of educational research; to distribute information concerning the need for research and the progress of research; to help research workers find funds for outstanding or needed studies. Only one more item needs to be added: In 1962 the Council for Research in Education gave up the ghost and joined other defunct councils and supra groups in whatever heaven they may enjoy.

There was, however, one NEA endeavor (1957) which provided to NSTA (and two or three other subject-matter Departments) the opportunity to participate in a meaningful way.

Known as the Academically Talented Student Project and supported by grants from the Ford Foundation's Fund for the Advancement of Education, the Project was designed to develop suggestions, reports of experience, and encouragement to action in regard to curriculum and instruction for that portion of the secondary-school population (the upper 10 to 20 percent) variously described as academically able, or talented, or science (or something else) prone. The underlying motivation was, of course, the "cold war" competition with Russia and the educational profession's response to critics of the time. The NEA portion of the project produced several publications of generalized nature, and certain of the Departments (e.g.; science, mathematics, music) were invited to contribute appropriate volumes for their respective specialty areas. An NSTA task group produced its report under the title. *Science for the Academically Talented Student in the Secondary School* (1959). All funding for this venture, including publication costs, came from the NEA project grant.

The general drive to "toughen up" and to accelerate the academic curriculum produced several kinds of responses in the schools, particularly at the secondary level. There was a short-lived attempt to move 10th-grade biology to the 9th-grade level. Advanced placement courses in science and mathematics were introduced in grades 11 and 12. Various "track" plans were instituted. Programmed instruction (somewhat akin to the workbook movement of the 1930-40s period) had a meteoric rise — and within a few years an equally meteoric fall. Various forms of computer-assisted teaching, closed-circuit TV, and other kinds of educational technology began to emerge. The pressure on students mounted; the growing philosophy of education seemed to many educators to be "teach the best and shoot the rest." By May 1959, the educational climate prompted NSTA President Herbert A. Smith to editorialize as follows:

> Today there is great pressure to use education as a screening device, "Let's phase out the loafers and the morons ... If the school must render custodial care, let's at least get such pupils out of the way of those who are going somewhere." This sounds sensible. But who is who?
>
> What are the infallible criteria which will categorize so neatly? Tests? Teacher ratings? Parental aspirations? Persistence? Motivation? Obviously, all of these criteria have merit, but equally obviously, all of them have their limitations ... There is a tendency to view standardized testing as a great panacea ... but more should not be claimed than can be defended. Tests are incapable of measuring motivation ... cannot measure persistence, drive, or integrity, or the lack of opportunity to know!
>
> The consequences of many intangible factors in education can be enormous when one considers the various degrees of cultural deprivation in the

> homes of millions of children. The impetus for growth and for the building of vision and wisdom will have to come from the schools for many such children, or it will never come ... Thus it behooves us to consider most carefully and critically those strait-jacketed academic plans which would consign large numbers of children to some academic purgatory as "poor educational risks" ... [and] increase the hazard of such mental categories as "the saved," "the also-rans," and "the lost." ... Let us chary in closing the door to opportunities. Let us be flexible in the shaping of our educational programs ... The function of education is not to screen but to stimulate; not to restrict but to expand opportunities; not to close but to open doors.

The one remaining NSTA-NEA relationship that merits inclusion in this story very early came to be known simply as Nanjemoy. It began in 1946 when one day a Charles G. Shamel appeared at the office of USOE Specialist for Science, Philip G. Johnson. The purpose of the visit, as gradually revealed, was to get some guidance on how to establish a solid plan to provide low-cost, interesting, and accurate booklets, mostly on science topics, for American youth. He was also interested in economics and some of the social sciences but regarded science as holding "the only substantial truth." His first contact apparently had been with AAAS, from where he was referred to the NSTA packet service office, and from there was referred to Phil. In due course it came out that Shamel was a PhD mining engineer with four other graduate degrees in science and law. Through inheritance, professional endeavors, business ventures, and personal habits, Shamel had amassed personal wealth in the neighborhood of a million dollars — and, as a bachelor already 79 years of age with only some nieces and nephews as his closest relatives and heirs, he was concerned about assuring that the bulk of his estate would go to improve knowledge of science among youth. He expressed great enthusiasm for a publishing project which he had conceived; namely, a series of Science Books for Youth.

Another science-related special interest of Shamel centered on a piece of property that he had acquired years earlier. Located in the Tidewater area of Maryland about 35 miles southeast of Washington, the tract embraced 235 acres of wooded land bordering on Nanjemoy Creek, which meandered through marsh areas to join the Potomac River near Port Tobacco, a thriving shipping point in Colonial times but consisting of only a few remnant buildings today. Shamel visualized the Nanjemoy property becoming a nature study preserve and conference center; in fact, it was this interest which he first discussed with Phil and pursued to a decision. It must be explained that early in discussions with Shamel on how to contact a suitable trustee to

receive his benefactions and honor his wishes, Phil had encouraged him to consider NEA — the largest, most representative educational organization, chartered by Congress, and including NSTA as one of its departments — and this Shamel did.

A formulation acceptable to Shamel was accepted also by NEA, and on January 22, 1948, Nanjemoy was transferred to NEA under a legal trust with NSTA, Science Service, and the University of Maryland also designated to name one representative each to the Board of Trustees. Interestingly, one passage in the trust deed specifies that a portion of the Nanjemoy area shall be "kept and maintained as far as possible in its original and natural condition, that is, allowing only the forces of nature to act on the vegetation and other life ... without any human interference ..." This aspect of Shamel's wishes has been respected but other desires have not been carried out, as we shall see.

After his death in 1954 Shamel's final will was contested, and litigation dragged on for about two years. In the end, about one-third of his estate went to his heirs and the balance was divided 60 percent to the NEA, 36 percent to the Illinois Education Association, and 4 percent to the Science Research Foundation, which Shamel had earlier established in his home state of Illinois.

NSTA relations with NEA in regard to Nanjemoy and the Shamel bequest produced no happy results, as far as we were concerned. After Phil left the Office of Education to return to Cornell University in 1953, I took his place as NSTA representative on the Nanjemoy Board of Trustees. In 1972 I simply quit in disgust with the lack of clear-cut objectives for development of the tract and no action whatsoever toward materializing Shamel's desires for a nature study-conference center — despite a 25-page master plan proposed by Phil in 1951. Clearly, NEA officials felt no moral obligation to transfer any of Shamel's money to support book publications in science, and they gave not the slightest hint of serious intentions to make real Shamel's dream for Nanjemoy.

NSTA Executive Director Silber reports that now Science Service has given word of no further interest in Nanjemoy and has relinquished its role as a participating member of the Board of Trustees. NEA holds only one position as a Trustee with the control and fate of Nanjemoy left in the hands of the University of Maryland. NSTA holds one position as Trustee. Silber reports a continuing interest in Nanjemoy among the NSTA Board

of Directors and has indicated his personal determination to do whatever is possible to resume active pursuit of Shamel's desires. Presumably, legal action will be required to revise the trusteeship, but who knows — a dead man's wish may come true 25 to 30 years after his demise.

Relations with Other Units of NEA and Other Societies

Several of NSTA's notable publications projects were accomplished in cooperation with other associations that were affiliated as Departments of NEA. Also, the NEA Safety Commission and NSTA collaborated early to produce *Safety Through Elementary Science* (1949) and *Safe Use of Electrical Equipment* (1951). It was this kind of bilateral cooperative effort that we found easiest to arrange, easiest to finance and manage, and highly satisfactory in mutual benefits. In most cases, financial costs and returns were both shared 50-50 and NSTA, because of special expertise, produced and contributed the manuscripts. The principal contribution of the co-sponsoring organization was its specialized membership group and, therefore, a sizeable market for sales of the publication.

The National Association of Secondary-School Principals (NASSP) was first to open the door to NSTA collaboration. That was in 1946 when we were invited to participate in the NASSP Consumer Education Study. This effort produced a publication on science in the education of the consumer and another one on specifications for industry-sponsored free and low-cost materials for science teaching. NASSP made a planned effort to keep its members posted on current developments and trends in the various curriculum areas and therefore called on the subject-matter associations periodically to produce special issues of the NASSP *Bulletin*. To this end, NSTA contributed *Secondary-School Science Teaching Today* (1953) and *Quality Science for Secondary Schools* in 1960. NSTA benefited from such cooperation by the dissemination of its message to approximately 17,000 NASSP members and by having available at printer's cost about 5,000 sales copies each of a publication useful also to science teachers, supervisors, and teacher educators.

In similar vein, NSTA worked closely with the National Association of Elementary-School Principals (NAESP) in at-

tempts to keep its constituency abreast of current philosophy and practices in the teaching of science in elementary schools. The publication *You and Your Child and Science* was produced as a joint project, and NSTA frequently was invited to arrange for authors to write articles for or special issues of the NAESP journal.

For both NASSP and NAESP, our Association frequently was asked to provide topics and speakers or panelists for program sessions of their annual conventions. This was also true for the conventions of the American Association of School Administrators (AASA) on at least a dozen occasions and of the Association for Supervision and Curriculum Development (ASCD) two or three times. It was through such connections of NSTA with those administrative and supervisory groups that most of the NSF-sponsored curriculum projects were first brought to the attention of these categories of educators. On two or three occasions, AASA invited NSTA to contribute chapters or sections for inclusion in "curriculum handbooks" which it prepared for updating its members.

The National Council for the Social Studies (NCSS) was an organization with which NSTA seemed to resonate. Mutual concern for the science-technology-society interface was, no doubt, what brought us together. We exchanged ideas and program content for conventions on several occasions, and the editors of our respective journals not infrequently called for help in preparing interdisciplinary content. NSTA provided considerable help to NCSS in the preparation of its 27th yearbook, published in 1957, which dealt with the impact of science and technology on society, and we promoted the sale of this publication among our own members. Tops in NSTA-NCSS cooperation, was a two-weeks workshop held at Sarah Lawrence College, Bronxville, New York, during the summer of 1958. The purpose of the conference was "to produce tentative plans and materials for the teaching of interrelationships of advances in science and technology and their socio-economic impact" in grades 9-12. Five or six principal problem areas were considered; e.g., health, population, energy, food supplies, and communication. The workshop participants were pairs or teams of one science teacher and one social studies teacher, mostly department chairmen, from each of 16 high schools located in the eastern half of the United States. Usually at least two experts in each area of consideration made presentations of factual information, current and foreseeable problems, and suggestions for

action by private and governmental agencies, concerned citizens, and so on. After suitable discussion periods with the experts, the teachers then put their heads together on the design and tentative formulation of instructional units and techniques that could be used for an interdisciplinary approach to these problems with students in their respective schools.

Out of such discussions in 1957 came the proposal for a science-social studies teachers workshop that would be co-sponsored by NSTA, NCSS, and JCEE. Moe Frankel, Executive Director of the Joint Council for Economic Education (JCEE), said, "You and Merrill Hartshorn (Executive Secretary of NCSS) select the schools and teachers and we at JCEE will raise the money. We can share in lining up speakers and organizing the workshop." And that's exactly the way it turned out. Incidentally, this was, I believe, the only major undertaking in which NSTA was represented solely by its Executive Secretary rather than a committee of its members.

The workshop was quite successful in producing perhaps 500 pages of tentative curriculum and instructional materials. The plan was to have the material reorganized, refined, and tried out by the teacher pairs in their respective schools during the ensuing year. Further revisions, pruning, and final editing were to be done the following summer when the teachers would be reconvened for another two-weeks workshop, after which it was hoped that at least a few units (they would probably be called mini-courses today) would be suitable for publication. Unfortunately, it was an idea perhaps ahead of its time, or a bad idea, or an incomprehensible idea; anyway, it didn't sell the second time around. JCEE was unable to raise funding, and the project had to be dropped. There was, however, one published product of the workshop, a report prepared by JCEE entitled *The American Economy: An Appraisal of Its Social Goals and the Impact of Science and Technology*.

What has been reported thus far is just about the total of NSTA cooperative undertakings with other groups housed at NEA headquarters. Interestingly, however, NSTA in 1952 joined with NCSS and the American Association for Health, Physical Education and Recreation in producing a booklet of suggestions for teaching about narcotics. Another ahead-of-its-time effort, the publication had only a meager role and a short life.

Surprisingly, perhaps, no joint project involving the National Council of Teachers of Mathematics ever developed. Sci-

ence and math might have been expected to be the first to get together, but neither of us ever hit upon an idea for a cooperative venture. The same can be said of project cooperation between NSTA and other science teaching societies such as NABT, AAPT, and CASMT. The only joint undertaking of any consequence between NSTA and another science teaching organization was in collaboration with the Division of Chemical Education of the American Chemical Society. Under the vision, talent, and drive of essentially one man — Theodore "Ted" Ashford, formerly of St. Louis University, now at the University of Tampa, Florida, the Division had developed an array of several committees to prepare tests in college and high school chemistry when, in 1954, Ashford proposed that NSTA officially join in sponsoring and preparing the high school tests. With approval of our Board of Directors, the first ACS-NSTA High School Chemistry Test Committee met at the 1955 national convention under the chairmanship of Elbert C. Weaver, Phillips Academy, Andover, Massachusetts. Ever since and to this day, as many as 40 to 50 volunteer high school chemistry teachers working on this committee have held work sessions of two or three days during NSTA conventions, carrying on their work by correspondence in between. The committees produced new forms of tests annually, and the sales of these ran around 200,000 copies each year. NSTA neither requested nor received any financial remuneration from the project, but the modest expenses of committee members were reimbursed as project costs.

Relations with Affiliates, Chapters, and Sections

A persistent goal of NSTA has been to bring about a united profession in the form of diverse, independent science teaching societies working together in common purpose through voluntary cooperation, not through monolithic membership or financial or organizational requirements. This was the goal also that motivated both antecedents of NSTA — the NEA Department of Science Instruction and the American Science Teachers Association — to enroll state and other such science teachers organizations as Affiliated Groups of the national body, a plan that was followed without change by the new NSTA. The relationships between NSTA and its Affiliates in those early days were, to say the least, tenuous and sometimes less than cordial.

But in those days, and indeed until perhaps only 15 years ago, state organizations of science teachers with any record of longevity or action programs worthy of mention were few and far between. Although many existed on paper, with most of them listed as subunits or departments of the general state education association, they were poorly organized and operated on miniscule budgets. They might flourish a year or two under an enthusiastic president, then practically die, not to be revived for five or six years until another enthusiast assumed leadership.

Such was the status and the nature of relations between NSTA and affiliated state groups as of, say, 1960. In addition to the state organizations, 20 or more organizations based on local, area, regional, or special interest rationale had also become NSTA affiliates; e.g., the Metropolitan Detroit Science Club; the General Science Teachers Association of New York City; the Hillsborough County (Florida) Science Teachers Association; the Illinois Chemistry Teachers Association; and the Elementary Science Association of Southern California. On paper, the roster of all affiliated groups was impressive; in fact, that was about all it was — little more than a sheet of paper.

A plan to reorganize the affiliates and to put meaningful dynamics into the new relationships was explored during 1959-60. In brief, the plan proposed to establish State Chapters of NSTA, to invite existing state organizations to re-affiliate as chapters, to encourage and assist with the formation of chapters in the other states, to retain Affiliated Group status for all nonstate organizations, and to arrange an appropriate mechanism whereby delegates from the Chapters and Affiliated Groups could meet annually with the NSTA Board of Directors to discuss policy matters, common problems, and ways to improve cooperation for mutual gain. Neither an NSTA membership requirement nor any financial obligation in either direction was a part of the plan, and full autonomy for the Chapters and Affiliates was assured. All was to be based on trust and voluntary cooperation. A forward step proposed by the plan was to enroll only one organization per state as a State Chapter, thus assuring that the organization would be comparable to NSTA in the enrollment of members from all levels and areas of science education and without restrictions or discrimination in regard to sex, skin color, religion, or other such factors.

The proposed new plan was discussed and debated in at least three regional conferences for affiliated association officers during 1959-60, and a final, wrap-up meeting for everyone

interested and concerned was held during the 1960 national convention. All features of the plan received votes of 69 to 93 percent approval in a spring follow-up opinionnaire. The following June at its Annual Business Meeting, the Board of Directors approved the plan, and it has been operational ever since. Possibly because of the "new spirit of cooperation" engendered by the change, but probably because of other factors and changing times as well, the existing state organizations (now State Chapters) seemed to gain renewed vigor and many new ones were organized. As of 1974, only about half a dozen states remained without a state association and a chapter of NSTA.

As for improved communications between the Chapters and Affiliates and the NSTA Board and headquarters, several moves were made that seemed to accomplish the purpose. First, increased responsibility to nurture and strengthen relations was assigned to an Assistant Executive Secretary, first to Henry J. Bindel and later and still to Dorothy K. Culbert. Follow-up activities from this have included frequent conference-type meetings for officers of the associated groups and several leadership conferences scattered regionally throughout the country. On three occasions, a Conference for Delegates of Science Teachers Organizations (CDSTO) was held during the two days preceding the annual meeting of the Board of Directors — at Denver in 1962, at Washington in 1963, and at Seattle in 1964. Many Board members came early to participate in the conferences, and usually half or more of the delegates stayed over to "listen in" on the NSTA Board meeting. With NSTA paying approximately half of the expenses of the delegates, as many as 30 to 40 different organizations were represented in these conferences. The CDSTO conferences were then dropped in favor of regional leadership conferences. The CDSTO kind of get-together was again planned for the 1975 Board of Directors meeting.

The cementing of relations with Chapters and Affiliated Groups (CAG) was considerably furthered by Robert Rice during his 1960 "presidential tour" of the United States and by Elaine Ledbetter in her 1972-73 IMPACT program and travels. Good feelings, information exchanges, and renewed commitments have been fostered by breakfast get-togethers of NSTA officials and officers of Chapters and Affiliated Groups during the National and Area Conventions of recent years. Also, ever since the Area Conventions were inaugurated, State Chapters have been encouraged to co-sponsor and promote attendance at

these and then receive a one-dollar rebate per person from registration fees paid by registrants from their respective states. This plan has been quite successful and satisfactory to all concerned. As many as 12 to 15 State Chapters may co-sponsor an Area Convention.

NSTA constitutions have always provided that Sections of the Association may be formed with approval of the Board of Directors, although the new plan of reorgnization will eliminate this category of associated groups. Very early in the development of NSTA and consistently thereafter, all thoughts or suggestions of Sections based on subject-matter interests were quickly quashed as being divisive, whereas a central goal of the Association was to overcome fragmentation and watertight curriculum areas in favor of coordinated, cooperative action for *a continuous program of science K-12* in the schools. Based on this concept and conviction, the five Sections authorized through 1974 have all been external, independent groups with national membership based on common, specialized concerns but groups eager to mesh with NSTA and share appropriately in cooperative activities. In the order of admission to the union, they were the Business-Industry Section (1950), the National Science Supervisors Association (1959), the Association for the Education of Teachers in Science (1960), the Council for Elementary Science International (1964), and the Council of State Science Supervisors (1973). Reviews of several specific publications and projects involving AETS and NSSA have been recorded in earlier pages of this history. The B-I Section is reviewed in a later portion of this chapter. Cooperative activities with CESI seem to merit at least a separate paragraph.

Apart from the few attempts to do joint projects, cooperative actions between NSTA and AETS, NSSA, CESI, and CSSS consisted chiefly of general support by the Sections for NSTA policies, position statements, committee reports, and membership recruitment and, on the part of NSTA, of efforts to enhance communication, increase involvement, and promote participation. Pages of *The Science Teacher* and *Science and Children* were frequently used for articles and information releases of special interest to the Sections. Since 1970 the President of CESI has been a member of the Editorial Advisory Board for *S and C* in recognition of this being adopted as the official journal of CESI. Over a stretch of 10 years or so, "summit conferences" for officers of NSTA and of the Sections were held at least in alternate years. Representatives of the Sections, usually their presi-

dents or presidents-elect, have served on the program committees for NSTA National and Area Conventions, and time, space, rooms, facilities, and printed program listings for as many as 50 to 60 sessions of the Sections during these conventions have been provided free of charge through the resources of NSTA. The general policy has been "no charges, no rebates, no separate registration fees" for the Sections.

Cooperation with CESI

Recent cooperative arrangements with CESI represent a "first," much closer working relationship than any previous arrangement with any of the Sections. In 1971 President Lerner appointed a Joint NSTA-CESI Committee to develop proposals for projects and activities that would be of special benefit to the members of CESI, to the individual elementary members of NSTA, and possibly to the library and institutional subscribers to *Science and Children*. Initially it was proposed to give the committee *carte blanche* control over an allocated budget of one dollar per head for each elementary member of NSTA (about $3500), but the Board did not approve. Instead, the committee was directed to submit proposals and budgetary requests annually and was given to understand that if deemed worthy by the Board, the proposals would be financed at least up to the total amount first requested. No such charge, no such promise had ever before been given to any such joint committee with any of the Sections.

Perhaps with the added feeling of being challenged, the committee enthusiastically and successfully went through its first year — the principal tangible outcome being the design and inauguration of the Elementary Science Packet Service and the issuance of three packets during 1971-72. The committee also gave first thoughts to several ideas which matured over the next year or two. One example: the committee recognized a still-unfulfilled need to reach schools and school systems with help on elementary science curricula, materials and facilities for teaching/learning, and instructional techniques and pupil activities. The committee realized that reaching several million elementary classroom teachers directly was impossible and that reaching even a significant fraction of the thousands of school systems was also out of the question. What the committee decided it could do on its budget of dollars and personnel was set up some model workshops for administrative and supervisory

workers in elementary education, run these workshops as a pilot effort and evaluate the results, then distill out the best of the results as the basis for a how-to publication that would encourage and assist other groups (State Chapters, for example) and institutions to "go thou and do likewise." Three such workshops were held during 1973-74 in Atlanta, New York City, and Muncie, Indiana. Assessment of results and follow-up planning for the handbook publication are scheduled as part of the committee's activities for 1974-75.

The potential for this committee to contribute significantly to advancing the role of science in the education of children is large — and very important. It seems that elementary-school level science always has been and still is largely a curriculum outsider seeking to justify itself and find time in the instructional program — and this despite all the reasons for elementary science that can be cited: the natural curiosities and interests of children in things of nature and science; the needs of all children and youth (who will become adult citizens of a technological society) to "know" scientific facts, principles, and concepts; the personal values in having experienced the processes of scientific inquiry or problem-solving and the role of evidence in decision-making; the importance of developing behavioral predispositions and patterns based on the spirit and methods of science; the potential of science study to help children in their reading, mathematical manipulations, the development of observational and manual skills, and the art-form expression of understandings, concepts, and "original" ideas. Unless these goals are pursued through effective science instruction from preschool, kindergarten, or first grade through about grade eight or nine, there is small chance of their being accomplished in one year or two years of study of the usual senior high school subject-matter-centered courses in biology, chemistry, and physics. There is still much work to be done in behalf of more and better elementary school science. The Joint NSTA-CESI Committee could have a long future ahead of it.

Relations with Business-Industry

Numerous references to Business-Industry (B-I) cooperation with NSTA have been cited throughout this historical narrative, and the examples that have been described cut across every facet of Association activities — membership services,

special projects and publications, conventions, youth activities, international activities, and making a go of things financially. With the exception of NEA, no other kind or source of support did as much as B-I to help NSTA become established and then build strong, diversified programs. This section of this chapter of the NSTA Story is an attempt to assemble the pieces into a mosaic that will portray a happy relationship that still endures.

The first mention of a serious courtship with business-industry seems to be in the minutes of a meeting of NSTA officers held in Washington in June of 1945 when the Association was only 11 months old. Since the mention begins with a report from a Committee on Public Relations, it is obvious that considerable thinking and activity had gotten under way much earlier. The committee reported progress on plans to solicit Institutional Memberships and outright grants-in-aid from B-I sources. Also, the committee recommended that its chairman, Reuben T. Shaw of Central High School, Philadelphia, be engaged to carry on an intensive campaign of solicitation during the summer months under a plan that, first, would assure full reimbursement of his expenses and, second, would compensate him for loss of income "normally derived from summer school teaching or other professional activities," the total not to exceed $1,000. The Executive Committee approved this and also a motion by Norman R.D. Jones and seconded by Morris Meister that "approved materials (useful in science teaching) be distributed by the Association on a cost basis with a notation that such action constitutes a service, but not necessarily approval." Thus was initiated the idea of the Packet Service, which remained operational through 1968. The summer solicitation idea, however, did not prove to be financially viable, though it helped lay a foundation for the future.

Roughly one year was required to get the Packet Service into full operation. Companies were invited to submit copies of materials which they deemed suitable for distribution, and these were reviewed by an Evaluation Committee headed by John C. Hogg of Phillips Exeter Academy, Exeter, N.H. The task of establishing evaluative criteria was made easier by the NSTA project on Specifications for Free and Low-Cost Educational Materials which had just been completed under the chairmanship of Harold E. Wise (President 1952-53). Materials which received approval by the Evaluation Committee were then solicited for distribution under a schedule of fees designed to reimburse NSTA for all costs involved. The distribution plan

was to collate available, approved materials into Packets for periodic mailing to members. Clearly, all of this was a bigger job than could be handled by volunteer committee members and Association officers widely dispersed. Hence the first staff employee of NSTA — Bertha E. Slye, who was appointed Director of Membership Service and set up a modest office at NEA in October 1946. Her job description consisted 99 percent of operating the Packet Service, and her salary depended on Packet income; the Association was too poor to afford the luxury of paid staff.

Bertha made the Packet Service go. She wrote letters to nearly a thousand science-related companies and corporations, she traveled and met the prone and the recalcitrant face to face in their own offices, she pleaded and cajoled — and got results. Materials came in for review, contracts were negotiated for the distribution of approved items, and arrangements were worked out with the NEA mailroom to collate, package, address, and mail the assembled Packets. The first Packet was issued in April 1947.

The Packet Service was the unique, big thing in NSTA's membership services in those days. *The Science Teacher* was a modest, four times a year magazine and was not under NSTA editorial control to begin with. Schools were still impoverished for instructional materials, and the Packet items filled unmet needs in hundreds of classrooms. For at least a decade, the Packet Service had as much value in generating new members and in retaining the old as anything we had to offer.

When I arrived in Washington in September 1948, Packets 1 and 2 had already been issued, and numbers 3 and 4 were in process for the fall of that year. The number of volunteers serving on the Committee on the Evaluation of Business-Industry Sponsored Teaching Aids (COEBISTA) had increased to approximately one hundred. As many as 30 submitted items were under review at any one time. Each item was evaluated independently by ten evaluators, and if as many as three turned thumbs down the item was rejected. Enough items flowed in, received evaluative approval, and became available that we were able to issue 80 Packets through school year 1967-68, a notable record of 20 years of cooperation with business-industry in an arena fraught with danger. There was always the risk that NSTA might be charged with flirting with "Big Business" or becoming the dupe or unwitting tool for propaganda dissemination. Nothing of the kind ever arose, however, due in large

measure to the excellent leadership of COEBISTA by Harold Spielman of the City College of New York City for more than a decade. He convened the COEBISTA members annually at NSTA conventions for the purpose of serious, professional reviews and discussions of the evaluative criteria, critiques of previously accepted items, and on-the-spot evaluations of sample items. Continually stressed were the central criteria that Packet items "must fit the curriculum, must be educationally sound and in good taste, and must contain no urging to try or buy a commercial product."

The 20-year record of the Packet Service attests to the success of a good idea. Business-industry was pleased, or support and participation would have been withdrawn. Teachers were pleased, or they would not have responded with coupon orders for as many as 15 to 20 thousand classroom copies of some of the Packet items. And the Association benefited not only in membership growth but also financially; we did not get rich on the Packet Service, but the activity paid all direct costs and provided between $5,000 and $10,000 annually toward salaries and overhead costs.

For the last three or four years of the Packet Service we used a commercial mailing service in Washington.

When the Packet Service died in 1968 after only two issues that school year, it was like losing an old friend. But times changed — new curricula, reduced B-I budgets for educational materials and services, and a growing, diverse NSTA membership made the shotgun approach uneconomical. Registry mailings of selected items to specific target groups superseded the Packet Service. When the Elementary Packet Service was instituted four years later, it was a case of the child born in the spitting image of the old man. The way it operates today, a review committee evaluates the materials submitted by B-I and other sources. Approved items are then solicited, contracted for, and assembled and mailed under staff management. A feature of the Elementary Science Packets not part of the original Packet Service is a pamphlet giving suggestions for classroom use of the contents of each Packet.

The Packet Service soon led to the CEDUR Program, which was an NSTA offering of Consultation, Evaluation, Distribution, Utilization, and Research. There was only one research effort, which produced a publication on *How Science Teachers Use Business-Sponsored Teaching Aids*, but we held at least a dozen consultation meetings at the behest of sponsors.

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At about the same time that the Packet Service was getting under way, conversations with B-I personnel led to the formation of the Advisory Council on Industry-Science Teaching Relations (ACISTR). It was chiefly Morris Meister and G. Edward Pendray who sponsored the idea. Pendray had been connected with the Westinghouse Company in Pittsburgh (was responsible for the Science Talent Search program with Science Service) and had organized his own public relations firm in New York City. Pendray arranged and chaired an industry-science teaching conference on December 28, 1947 in conjunction with NSTA's participation in the AAAS meeting of that year in Chicago. Meister was the principal spokesman for the science teaching component of the conference. With typical Meisterian eloquence, he told the conference:

> More than a million teachers and fifty million persons are engaged in the business of education. What these millions think and why they behave as they do must be important to industry. Quite apart from the market for industry's products which they represent, the classrooms of the nation can and do condition the kind, the quantity and the quality of goods and services produced. Out of the nation's classrooms comes the personnel, whose intelligence, energy, and skill are needed to keep the wheels of industry turning. In these classrooms sit young men and women who will shortly furnish the ideas and the creative genius that will improve, modify, and revolutionize technology ... Most important of all, the classrooms are places where youth obtains knowledge and understanding of and develops attitudes toward our American way of life. Since industry and science teaching are partners in the enterprise, it is important that good relations between them be established. Unless this is achieved, science teaching cannot receive the help which it badly needs, and industry will find in the schools not sales resistance but hostility.

Within two months, on February 21, 1948, to be precise, the Advisory Council was organized — at the annual meeting of AASA in Atlantic City, New Jersey. The first AC was comprised of eleven B-I representatives and nine from NSTA, all of them invited or appointed to serve three-year terms. Meister was elected chairman and Slye served as secretary. A campaign was launched to solicit B-I grants-in-aid to the Council — not to NSTA, mind you — and ultimately about $27,000 was received. Over the next two years, this money was expended almost 100 percent on related office expense, solicitation travel, and in defraying the costs of two or three meetings a year including payment of all expenses of the NSTA members but not the B-I members, who traveled and lived at company expense. The Council spent over half of its time at meetings in discussions of the Packet Service and in advising on the CEDUR program. The Council arranged professional programs at the annual meet-

ings of AASA and AAAS. A special conference — and, in my opinion, the best ever — was held in September 1949, at the Mellon Institute in Pittsburgh. This conference attracted 69 B-I representatives and 201 science teachers. The participants spent most of the day in three workshop-discussion groups devoted to aspects of industry-sponsored teaching aids for science. The viewpoints and recommendations of these groups, along with one general address and three "group presentations," were later assembled into a *Report of Proceedings*, copies of which were mailed to all NSTA members and to approximately one thousand B-I companies. This came soon after the December 1948 ACISTR-sponsored study of How Science Teachers Use Business-Sponsored Teaching Aids was reported in a bulletin-type publication, which reached more than 500 B-I companies. The impact of these reports really advanced the cause of NSTA-BI cooperation. By April 1950, a special committee began work on a plan of organization and at the Board of Directors meeting the following June, the Business-Industry Section of NSTA came into being. Armed with a constitution, dues, officers, committees, a newsletter, and other hallmarks of a *bona fide* organization, the B-I Section soon generated some 250 members and began writing its own history, the details of which need not be included in this Story of NSTA.

Cooperative relations between NSTA and its B-I Section soon jelled into three principal kinds of endeavors. First was the maintenance of a "bridge" between science teachers and business-industry. The Advisory Council, with its B-I members now appointed by the B-I Section, continued to serve this function until 1955. By that time the group recognized that it had fully exhausted its ideas for significant activity and that there no longer existed any fund belonging to the Council which it could use even for paying the expenses of one annual meeting. Therefore, the group voted itself out of existence but recommended that the "bridge" be continued through at least annual meetings of the respective Executive Committees of NSTA and the B-I Section. This plan was put into effect in 1955, but it, too, was abandoned after four years of feeble, unproductive effort. Thus the "bridge" became a "gap" until 1972 when a new Advisory Committee on NSTA Business-Industry Relations was named. Comprised of five B-I persons invited by NSTA plus the President, President-elect, and Executive Secretary of NSTA, it was expected that this committee would be a sounding board, or evaluative and advisory group, to react to Association proposals

for special projects, fund-raising endeavors, FSA programs, and other B-I related projections. Again, however, there was a noble beginning but a rapid decline, and the committee was dropped as of 1974; the "gap" was restored.

Both of the other two kinds of B-I-NSTA cooperation centered on NSTA's annual National Convention. The B-I Section promptly scheduled its annual business meeting to coincide with the Convention, and also accepted the opportunity to organize two or three panels, seminars, or other kinds of concurrent sessions as part of the total program. In fact, a B-I representative usually served on the central program committee charged with planning the entire Convention. Perhaps once in three years, on the average, a B-I speaker has occupied the spotlight at one of the Convention general sessions. Also, the B-I group has made the Convention the occasion for ceremonial presentation of two annual awards in recognition of outstanding contributions in the realm of business-sponsored materials for science teaching. One award goes to the company, trade association, or other B-I group considered to have made the year's topmost offering of instructional materials, an aid program, or other type activity in support of science teaching. The second award goes to a science teacher selected as representing an outstanding example of creativity and effectiveness in the utilization of business-sponsored materials. Both B-I participation in the Convention and the presentation of the awards at the Convention were in force as of 1974.

Change was probably an inevitable by-product of growth in B-I Section membership. As new members were enrolled, more and more of them were individuals or came from organizations for whom science was not their primary interest or concern. This diversification of membership resulted in a thorough-going reorganization in 1965 and the emergence of the National Association for Industry-Education Cooperation (NAIEC). Still enrolled as a Section of NSTA, NAIEC continued the above-described cooperative activities while further developing its own programs. By 1974, however, the organization yielded to the feeling of many of its members that section status in NSTA unduly restricted, or gave the impression of restricting, its sphere of operations to science. NAIEC thus became totally independent of NSTA, and the last official link of NSTA with business-industry was dissolved.

Numerous B-I sponsored activities and projects were undertaken by NSTA through the years entirely apart from the

Advisory Council, the B-I Section, or NAIEC. Some were short-lived, some have survived several years of operation. Illustrative of the latter category are:

- the Annual Damon Lecture, endowed by the Damon Foundation with $2500 for procurement of keynote speakers at the annual national convention (initiated in 1968)
- the annual convention Science Seminars, sponsored by Sun Oil Company, supported by grants of $10,000 each year (beginning 1968)
- annual selection of outstanding trade books in science for children, in cooperation with the Childrens Book Council
- the STAR and OHAUS Awards, sponsored, respectively, by the American Gas Association and the Ohaus Scale Corporation, supported by annual grants of approximately $5,000

Short-term and special projects involving B-I cooperation and support have included the following:

- special conferences on science in the education of the disadvantaged at three national conventions, sponsored by Prentice-Hall, $1500 annual grants (1972-74)
- a survey of the teaching of nuclear energy in secondary schools, sponsored by the Atomic Industrial Forum, with a supporting grant of $12,000 (1972-73)
- two special Institutes on Science Teaching, sponsored by the Thomas A. Edison Foundation (1951 and 1952)
- the formation of the NSTA Exhibitors Group to develop criteria and guidelines for assuring the educational values of commercial exhibits at national conventions and other meetings of the Association (1966-73)
- a joint undertaking with Charles Scribner's Sons to produce and publish a Science Calendar (started in 1974)

It can also be recorded that half a dozen or more B-I proposals and requests for assistance were rejected on the grounds that they would exploit NSTA's name and prestige.

Finally, due recognition should be recorded for the invaluable support accorded NSTA by the various advertisers who purchased space in the journals published by the Association. This form of "cooperation" was, of course, a business effort on the part of the advertisers, but from the NSTA point of view it constituted a flow of valuable information much desired by teachers in their considerations of new products and instructional materials. Moreover, the financial income from advertising enabled the Association to develop and maintain the high professional quality of all three journals. None of them could

have reached today's levels of achievement — and none could have survived as a profit-making private enterprise — if the allocation of a portion of membership dues had been the only block in the financial foundation. It was NSTA relations with business-industry, in my opinion, that set us most uniquely apart from all other educational associations.

Relations with Governmental Agencies

NSTA's working relations with the federal government have extended throughout its 30-year history, and the specific undertakings have ranged from simple cooperation with no money involved to fairly large, sometimes extended, programs or projects under grants or contracts. Most of these endeavors have been reported in earlier chapters, but it seems in order to recapitulate here for the purpose of providing a master list, together with a roster of the agencies.

A. The U.S. Department of State
   1945 — NSTA requested to prepare report on course content and teaching apparatus for science at elementary, secondary, and college levels; funding by Scientific Apparatus Makers Association.

B. The National Cancer Institute
   1955 — Drive-in conference arranged for about 200 teachers; follow-up articles published in *The Science Teacher*; no funding.
   1956-60 — NCI supports STAR awards program, underwrites publication and distribution of reports; approximately $40,000 per year.
   1960 — Funding approved for project to produce six science career and guidance films; approximately $100,000.

C. The U.S. Office of Education
   1950 — Cooperates with NSTA in project to produce publication dealing with science teaching facilities for secondary schools; B-I funding, no USOE money involved.
   1966 — Grant to NSTA to develop an elaboration (with suggestions for classroom instruction) of the *Theory Into Action* publication and of NSTA's version of conceptual schemes of science; about $40,000.
   1967 — Funding to support a project on emerging educational technology and implications for science teaching and educational supervision; about $100,000.

1972 — Grant to NSTA to support a team analysis of findings from first National Assessment of Educational Progress in science and publication of a report; approximately $35,000.

Additional words should be recorded relative to the NSTA team analysis of the science findings from the first National Assessment of Educational Progress. A couple of months after the initial release of the findings, it was reported that NAEP intended to call together a group of experts to discuss the meaning of the results. President Lerner immediately wrote to the Director of NAEP as follows:

> "... I am disturbed by the report ... that (only) scientists, consultants from industry, and other fields in the business world, etc. will participate in these sessions to discuss the educational implications of these results. Nowhere ... is there mention of the involvement of science teachers or science educators ... As the largest science teachers organization in the country, covering all grades K-12, we have members who would make notable contributions to your deliberations. Certainly any changes which are produced in methods, materials, or approaches must ultimately involve the classroom teacher to be effective ... Because of the complexity of the problem, I believe that the science teaching profession must be involved ..."

The NAEP response was prompt and courteous — and to the point: give us an outline and a proposal for NSTA to do the analysis. We did: moreover, the proposal was accepted and within a month the USOE funded the project with a grant of $35,000. And then NSTA proceeded to name a study team comprised only of science education representation, omitting and ignoring all other kinds of interest groups! A report of the study team was published in 1973, a condensation of which appeared in *TST*, September 1973, p. 33.

1974 — Joined by Federal Energy Administration in providing grant for Energy-Environment Materials Project to develop three volumes of source materials and instructional suggestions for classroom application at all educational levels; approximately $100,000.

D. The National Aeronautics and Space Administration

1963-1970 — Funding for continuous program of annual Youth Science Congresses; about $50,000 to $90,000 per year.

1963 — Funding to underwrite development of six titles in the series, Investigating Science with Children; about $19,000.

1964 — Funding for NSTA-NASA Aerospace Project to produce handbook for teachers at junior high school level; approximately $6,000.

1971 — Funding for Skylab Student Project; approximately $112,000.

1974 — Funding of Viking Lander Student Project; about $80,000.

E. The National Science Foundation

1958 — Funding provided for invitational conference and publication on *It's Time for Better Elementary School Science;* approximately $15,000.

1959 — Funding to support invitational conference and publication on *Planning for Excellence in Secondary School Science;* approximately $15,000.

1956-1966 — Financial aid provided to assist in compilation of annual U.S. Registry of Teaching Personnel in Science and Mathematics (and later, including the social studies); about $40,000 per year average.

1960 — Financial assistance for first NSTA delegation to attend meeting of British Science Masters Association [later renamed Association for Science Education]; $2500.

1970 — Funding provided to support nationwide study of exemplary facilities for secondary school science and issuance of a filmstrip-cassette tape kit and a book publication; approximately $90,000.

1971-1973 — Financial support for special sessions and activities in continuing education in science at Regional Conferences and Area Conventions; about $19,000 per year.

1972 — NSTA cooperates with NSF to make the latter's series of films on frontiers of scientific research available for classroom use; no funding involved.

1974 — Funding for a nationwide study of innovative project activities in science in grades 7 to 12, with publication of a selection of exemplary activities scheduled for a special issue of *The Science Teacher* in June 1975; approximately $28,000.

As earlier reported, the NSTA role in the various curriculum projects funded by NSF was extremely peripheral, consisting almost entirely of providing media and means for the dissemination of information and for forum-type discussions of the projects.

The above summary, brief and factual that it is, gives not the slightest hint of the frequent and extensive interactions of NSTA

officers and staff and their counterparts in all of the agencies listed, plus others as well. Washington office conferences were numerous, and the Association benefited from generous participation of agency personnel in a variety of NSTA activities. Staff members of USOE and NSF have served as members of many of our committees. Representatives of perhaps a dozen different agencies have participated as speakers, panelists, workshop leaders, and in other ways at national and area conventions, at regional and special conferences, and in many of NSTA's youth activities programs. Displays and exhibits by numerous governmental agencies have been consistent components of NSTA conventions, in many instances through the payment of fees for space occupied.

There were several other cooperative endeavors involving NSTA and diverse government agencies through the years, but perhaps three examples will suffice to illustrate the kinds of things we did. During the early days of the Packet Service (say, 1947-52), the Atomic Energy Commission supported an active office for the preparation of educational materials, and several of these items were distributed in our Packets. We were called on perhaps half a dozen times to review materials in progress, evaluate, and offer suggestions for improvement. Similar experiences could be reported for a few other agencies; e.g., the U.S. Forest Service, the National Park Service, the Department of Commerce, and the U.S. Department of Agriculture. We explored, cooperated in one way or another, but found no common ground or "big idea" on which to build a big project.

In 1952, the Civil Defense Administration embarked on a series of booklets for school use and called on NSTA to provide a work-conference team to give assistance in the preparation of a title for science teachers. Our group, headed by Stanley E. Williamson, joined the CDA staff and a few other consultants for a five-day work period at a secluded conference center near Olney, Maryland. They did their work well, and later we received office copies of the 150-page (more or less) conference report.

My third example, and *finis*, is a cooperative effort that involved no grant, no expense reimbursements, but only study and a lot of hard work on the part of a volunteer group of science teachers and the staff of the government agency. The project came about as the result of our contact person at the National Cancer Institute "knowing someone at the U.S. Public Health Service" who was interested in an idea. The idea was, and the

project turned out to be, the preparation of a series of laboratory investigations for junior and senior high school level based on, derived from, and emulating the actual research studies of scientists at the Robert A. Taft Sanitary Engineering Center of the USPHS at Cincinnati, Ohio. With the stated purpose of assisting teachers "in developing current, practical, and interesting laboratory exercises," a dozen or so Cincinnati science teachers under the leadership of C. Leroy Heinlein, a teacher of general science, collaborated with Taft Center scientists, engineers, and technicians to produce a dozen "for-instance" experiments which were published in the eight issues of the 1958 volume of *The Science Teacher*. Collated reprints were made available and some 2,000 copies were purchased. Examples of specific experiments could be Analysis of Radioactivity in Vegetation, Micro-Fungi in the Soil, Bioassay of Water, Separating Complex Substances by Chromatography, and Determination of Half-Life. As a former science teacher, as editor of *TST* at that time, and as executive head of the Association, I felt then and still do that this project was a fine example of productive cooperation at its highest. In all, perhaps 20 science teachers and practicing scientists contributed unselfishly "over and beyond the call of duty" with the hope and reward being only that of serving thousands of other science teachers and their students all across the United States.

Relations and Cooperation with Other Groups

The end of this chapter draws nigh. A complete review of all other cooperative efforts between NSTA and other diverse groups would be a boring task to do, even more boring to read, and in my judgment would not add very much to the core substance of the NSTA Story. It could only be reported that the Association provided consultation as requested in possibly as many as twenty instances. Usually, in these brief encounters, a member of the headquarters staff served as the consultant. Seldom, if ever, however, did the Association give permission to state or imply NSTA endorsement of the product (usually, printed materials). In a few cases, a credit line acknowledging "with cooperation of" or "in consultation with" NSTA was permitted.

There were, however, three lines of cooperative endeavor that perhaps should be reported with a bit of detail. The first of

these is the area of research in science teaching. The Association has had a Research Committee (by whatever name) on and off since the earliest years, the general purpose of which was to help reduce the lag or gap between the reporting of research and the application or implementation of research findings in classroom practice. A noble goal, but how does a committee achieve it? First off, remember that (a) most research in science teaching is done by graduate students in pursuit of their PhD's or EdD's; (b) the great bulk of completed research studies are filed in college and university libraries and go unpublished; and (c) the studies that are published appear mostly in specialized professional journals — such as *Science Education* and the *Journal of Research in Science Teaching* — which are read by not more than a few hundred of the nation's 100,000 science teachers. Small wonder that the research committees, one after the other, suffered frustration and demise. Their best efforts were to generate occasional articles for *The Science Teacher* and *Science and Children*, the acme of which was a series of Spotlight on Research reports prepared by William B. Reiner of the Bureau of Educational Research of the New York City Public Schools and published in *TST* during 1957-61. During 1969-70, a somewhat similar series of reports or summaries of research prepared by the ERIC Center at The Ohio State University ran in issues of *TST* and *S and C*.

Far more functional, it seems to me, are those Association efforts which tend to generate teacher attitudes and dispositions favorable to *doing* classroom research, experimentation, and innovating — in a word, to generate "the spirit of research" as the starting point for developing *respect* for research and the disposition to *modify* one's teaching behavior through the *utilization* of research. In line with these beliefs, I would applaud the Association's program of On-the-Job Research grants, the STAR and OHAUS awards, the *Theory Into Action* publication, the contributed papers sessions at conventions, and the 1974 study of innovative science teaching activities.

Another line of cooperation but quite different from anything previously reported involved working with the Black Caucus (BC), a loosely organized group of Black members of the Association plus a few other minority group representatives. After informal group assemblies held at the 1969 and 1970 National Conventions, the Black Caucus organized itself during 1970-71. At the 1971 Convention the BC presented to the Executive Committee a statement of what came to be called "concerns and proposals." The Black Caucus never adopted more than a

mildly militant attitude, and the Executive Committee seemed sincerely understanding and cooperative. Reuben Pierce, Supervisor of Science for the D.C. Public Schools, and I were commissioned to re-work the statement for official presentation to the Board of Directors the following July 1971. At the Board meeting, to which Pierce was specially invited, he said in substance that the Black Caucus "has the immediate goal of increasing minority group (not only Blacks) involvement in NSTA activities and decision-making at the level of the Board and Executive Committee and at the levels of working committees, program participation in conventions, and so on", further, that "the long-range, ultimate goal of the Black Caucus is to 'go out of business' as soon as the other goals are accomplished and assured." The Board responded with positive resolutions on several of the concerns and proposals and also issued a standing invitation to the Black Caucus to send a representative (nonvoting) to future Board meetings. Pierce attended one session (about an hour) of the 1972 Board meeting, and that was the last heard of or from the Black Caucus. Presumably, it was a case of immediate goals attained, ultimate goal proclaimed. This experience, coupled with NSTA's previous record of no "second-class citizens" among its members, would seem to support the contention that the Association has been a force for humane, civilized relations among people of diverse characteristics. It will be recalled that Blacks and other minority group persons have served on boards and committees and have participated in conferences and conventions throughout the years; also, that NSTA broke the color barrier in the 1952 meeting in Atlanta, triggered the end of the racially-segregated dining room in NEA's Martinique Hotel in Washington, and refused to affiliate racially separated state organizations from 1960 onward.

Finally, somewhat of a review of NSTA endeavors in the areas of conservation and concern for the environment. The Association made a few early attempts to do something through the naming of committees, but these efforts bore little fruit because funds to support undertakings of significance simply were not available. A fresh start was made in 1969 with the appointment of a Committee on Conservation and Environmental Studies under the chairmanship of W. Eugene Vivian, Conservation and Environmental Science Center, Browns Mills, New Jersey. This committee promptly developed several in-house activities, including articles for NSTA journals, program sessions at conventions, and two specially designed convention

workshops. The crowning endeavor of the committee consisted of two drive-in workshops on environmental education co-sponsored by cooperating host institutions. Interdisciplinary in character, each two-day workshop accommodated approximately 40 junior high and senior high teachers, mostly from the areas of science and the social studies. The first of these was held at Riverside City College, Riverside, California, in April 1971, and the second was held at Bowling Green State University, Bowling Green, Ohio, in June 1971. The host institutions provided facilities, meeting rooms, and some staff; the participants paid a modest registration fee; and the cost to NSTA was only travel expense of the committee chairman. Unfortunately, there was no published report of what must have been two quite successful workshops; only a succinct report appeared in *The Science Teacher* (November 1971, p. 11), but consider these "words of wisdom" which it contains:

> Workshop participants were in agreement on these basic considerations in the development of a good environmental program:
> 1. The program should have an educational rationale and clearly defined objectives.
> 2. The program should identify and deal with real problems found in the community.
> 3. The program should provide much "hands-on" experience and on-site investigation.
>
> On the topic of Learning Approaches for Junior-Senior High School Students (six topics were considered), the workshop participants had this to suggest:
> 1. The approach should be interdisciplinary.
> 2. The approach should be learner centered.
> 3. The approach should be problem oriented.
> 4. The approach should result in behavioral changes.

Midway 1972, an inter-society conference on environmental education, supported by a grant from the Johnson Foundation (of the Johnson Wax Company), Racine, Wisconsin, was called to consider what might be done to improve communication, coordination of activities, and increased efficiency in planning among organizations and agencies already active in this educational arena. NSTA was represented at the conference by Kenneth Dowling, Supervisor of Science, State Department of Public Instruction, Madison, Wisconsin. The conference developed a proposal for a consortium-type organization to be called the Alliance for Environmental Education (AEE). By May of 1973, the Alliance had been embraced by 20 orgnizations, groups, or agencies, including NSTA as a charter member, and the AEE Board of Directors held its first annual meeting May 9-11 in Airlie, Virginia. Dowling was elected first President of

AEE. Among the diverse kinds of organizations and agencies taking on membership in AEE, these are illustrative:
American Nature Study Society
The Conservation Foundation
Girl Scouts of the United States of America
League of Women Voters
American Forest Institute
Izaak Walton League of America
National Wildlife Federation
Soil Conservation Society of America
National Association for Public Continuing and Adult Education

As of 1974, AEE was in business as an on-going organization. After the Airlie meeting, it was announced that the Alliance "hopes to achieve its goals by facilitating communications among organizations concerned with environmental education, and by encouraging cooperation among them." Also, "Plans are for headquarters in the Washington, D.C., area and foundation support for full-time operation" under an executive director. Meanwhile, the AEE Board accepted the offer of the University of Wisconsin-Green Bay to supply part-time service of one of its staff members, William Lynch, as interim executive director. At the 1974 meeting of the NSTA Board of Directors, representative Dowling reported that "the Alliance, in spite of limitations it has faced in the past year, seems to have survived its infancy." AEE had had only modest financial support from its members but was aided by another grant from the Johnson Foundation. A major portion of the year's activities had been directed toward seeking funds from public and private sources, but with little success. Jack Snell, Warsaw, Indiana, gave quarter-time service as Executive Director (without salary) during 1974-75, primarily in fund-raising activities and "conducting usual business." Thus it seems that AEE is facing all the problems usually faced by most consortium-type organizational efforts. At least a few years more will be needed to reveal what its history is to be.

Epilogue

Thus endeth my account of The NSTA Story: 1944-1974. But how can a historian stop in mid-air, so to speak? NSTA goes on and will go on, and there will be a new crop of able, dedicated persons equipped with fresh ideas and ready to take on the responsibilities and the challenges. They may look to history, but they will surely not rely on the dead-hand of the past. Therefore, rather than putting a period at the end of a last sentence and laying down the pencil, I have asked the first and last Presidents of the 1944-74 era, and Robert L. Silber, the present Executive Director, to contribute their thoughts, reflections, and hopes.

For myself, I reiterate thanks for the opportunity to serve and for the confidence that supported me for 26 years; extend appreciation to the hundreds of persons with whom I worked — presidents, officers, board members, committees, staff, and representatives of cooperating groups; acknowledge, praise and thank the many thousands of members without whose support and encouragement there would be no continuing NSTA Story. — RHC

Our Initiating Goals

Philip G. Johnson
First President of NSTA, 1944-46

Involvement in the problems of World War II sparked our concern for science education in the post-war world. In 1943 I was serving in the Pre-Induction Training Section of the War Department. It became necessary to bring together leaders from a number of science teacher organizations to help prepare suitable training materials. All of us could see that the end of the War

was approaching, and we asked ourselves and each other what we might do to provide effective leadership for the years ahead. Many of the individuals shared the feeling that there were too many struggling science teacher organizations and too many relatively weak publications reaching too few of our teachers. There was a lack of unity of effort among the science teacher organizations although we had found that we could work in a unified way to help win the war.

The important question was: how can our peacetime problems be solved by such struggling organizations and limited publications? We all wondered whether we should resurrect and try to bring to reality the dream of a single major influential organization of science teachers. We decided that we must try to do it. We agreed that all science teacher organizations must be approached to discuss this challenge, to exchange ideas in small local sessions and by mail, and then to come together again at our own personal expense to share ideas and to develop the unifying plans. You know the rest of the story because it is reported in this volume. In brief, it launched the National Science Teachers Association.

There were several key ideas in the minds of the individuals who struggled to reorganize the Department of Science Instruction, to organize the American Science Teachers Association, to reorganize the Department into the American Council of Science Teachers, and finally to form the NSTA. These ideas, it seems to me, were somewhat as follows:

A. There should be one major organization of science teachers with both scientific and professional relationships.
B. The organization should serve science teachers at all levels and be concerned with all the scientific disciplines.
C. Through widespread mergers, affiliations, and cooperation, many national, regional, state, county, and city organizations, the unified organization would reach many, many science teachers with professional and scientific aids while providing opportunities for friendship and active participation.
D. There should be one major journal for science teachers, with special publications to be made available from time to time through the efforts of the unified organization.
E. The one major organization would promote needed developments through the seeking of support, where it may be available, and by organizing teams and committees to bring about valuable and needed services.

F. When agencies, groups and individuals with resources had under consideration something which would bear on the work of science teachers, they would be able to consult with the leaders in the major organization and, if approved, they could receive consultative or more direct help in the establishment of a useful service.

G. The one major unified organization would grow in influence over the years and would develop a center that would ensure the continued existence, influence, and service along the lines that science teachers themselves would consider to be appropriate.

Other persons among the many founding individuals would surely state the key ideas in different ways and in a different order. They would undoubtedly add to and subtract from my seven statements. Yet, if their ideas were to be compared to what has happened, I believe the overwhelming consensus would be the same. Namely, that NSTA has realized far more than anyone dared to dream. Thanks to dedicated staff, competent officers, well-chosen directors, widespread representation on committees, and hosts of able participants, our NSTA is today a major organization of science teachers. It serves science teachers at all levels and in all science disciplines through publications and personal involvements. It is looked to for guidance and for active help in the providing of services to science teachers. It has initiated and developed many major services not only to classroom teachers but also to school administrators, science supervisors, school architects, scientific equipment producers, and to scientists. While it has not won full cooperation of all organizations of science teachers, it has in a friendly and constructive manner pointed out by its own work how economies can be realized while extending services to more and more science teachers at all levels and in all areas. Other organizations of science teachers have provided constructive competition along with friendly cooperation, all of which strengthens the overall services to science teachers. NSTA has developed a National Center as a headquarters for all science teachers and their organizations of today and tomorrow. It is the partial realization of many dreams but not the full realization. There are continuing opportunities for science teachers of today to make great personal growth while they strive to improve, expand, and keep the organization in tune with changing needs and look forward to new challenges.

NSTA in America's Third Century

Leslie W. Trowbridge
Twenty-eighth President of NSTA, 1973-74

As the nation enters its third century, it is interesting to speculate what influence the National Science Teachers Association will have in the developing and growing field of education in science. Where does NSTA go from here? Its potential for membership is great. Now, only one in five current science teachers at the secondary level is a member of NSTA. Perhaps only one in 50 elementary teachers in the United States is a member. The increasing number of junior colleges in the United States — several thousand to date — has created a membership potential in the junior college sector. It is probably not unreasonable to expect that in the next 20 years, the NSTA could double its membership. At both ends of the educational scale, there are potential services that can be developed. In the preschool sector, increasing programs are being planned. At the college and university levels, more interest is being shown in education matters, particularly in relation to improvement of teaching for students in the general education field.

However, membership alone is not necessarily a guarantee of value or strength of the organization. Service to science education is of utmost importance to the NSTA. The constitution of the NSTA, adopted in 1945, spells out some of the service aspects within the responsibilities of the organization.

As science educators become increasingly involved in individualization of instruction, humanistic teaching and learning practices in science, interdisciplinary science teaching, setting of competency and performance standards for students and teachers, certification and teacher education standards, and other new trends in science education, it is important that NSTA involve itself fully in these matters. With its past record to build upon, it can be confidently expected that the National Science Teachers Association will play an important leadership role in many of the new trends becoming evident on the horizon of science education.

The new organizational structure developed in 1974 sets the stage for new thrusts. For example, the newly created Research Division will help put research results into science classrooms. It may tend to encourage more and better research from teachers

and educators in science. The affiliation of NSTA with a strong, on-going research organization such as the National Association for Research in Science Teaching will facilitate this activity. We have for a long time decried the absence of transfer of the results of research in education into better educational practices in the classroom. NSTA now has a mechanism by which this gap can be narrowed substantially.

The Teacher Education Division with competent assistance from the Association for the Education of Teachers in Science will be involved in matters of continuing education, certification, professional standards and teacher benefits. One would expect that the Division would deal with matters of teacher education in science from kindergarten through college. The improvement of the quality of teachers in science will be a logical outcome of the efforts of this new division.

The Division of Supervision will facilitate and improve relationships with another segment of the education community, science supervisors and coordinators. It will bring into closer liaison an influential group concerned with curriculum and budgetary matters in science education in public and parochial schools.

The respective level divisions including the Division of Pre-school and Elementary, the Division of Middle School and Junior High, the High School Division, and the College Division, which have come into existence with the new organization structure will function to improve articulation within and between the various levels of science education, K through 16.

With the energetic leadership of competent science teachers devoted to professional matters in their field, NSTA will continue to prosper. It is likely that the association will assume an even more influential role in education in science in the next few decades. Its potential for impact in international science education will perhaps be even greater than in the past. The cooperative efforts already initiated with several international agencies, such as ICASE and UNESCO give promise of increasingly fruitful activities.

The past 30 years — the lifetime of NSTA — has been an extremely exciting time in science teaching. The momentum generated by our professional association in a variety of thrusts will undoubtedly carry us forward to increased leadership and service to science teachers in the future. We all have an important part to play. We have a responsibility to support the Association and to encourage its efforts in matters relating to the

improvement of science teaching for all individuals. This is an organization with a bright future!

Looking Ahead

Robert L. Silber
Executive Director of NSTA

The NSTA story, told here by Robert H. Carleton, is the history of a great organization and the dedicated people who built it. From modest beginnings in 1944, it has grown to over 20,000 members — making it by far the world's largest professional association of science educators.

The association's first 30 years were sometimes precarious but always exciting. Looking ahead to the next 30 years and beyond, I continue to see both opportunity and challenge. In this period we anticipate a doubling of membership, giving NSTA the opportunity to exert even greater leadership in science education. As the world changes more and more rapidly, NSTA will become increasingly responsible for the continuing education of science educators. This will be accomplished in part by an expansion of the publications program and the journals; by conventions and conferences that reach more persons and are broadened to include students, parents, and members of other disciplines; and by a program of continuing education opportunities designed specifically to keep teachers and others well informed of developments in science and education.

I see increasing attention given to the science educator's role in a complex society. For example, the emphasis on understanding interrelationships between science and societal problems in such areas as energy, food, and population must grow. And we will become even more concerned with the full development of our students as human beings. NSTA will insist that humanistic concepts become an integral part of education, and will promote the recognition that both learning and work are lifetime endeavors which should be more intimately interwoven, one with the other.

With global interdependence already a reality, the future will bring increased international activity, including, for example, cooperative exchange programs of teachers and supervisors. And the untapped resources of industry and government will be called upon to take a more significant role in education.

We are in for an exciting time. But we will only reap the rewards of the future if we are open and responsive — and if the commitment of NSTA members to better science education remains as strong as it has been in the past. Together we can confidently accept the challenge of the future.

APPENDIX I

A PROPOSED STATEMENT OF PRINCIPLES BASIC TO INSTRUCTION IN THE NATURAL SCIENCES*

Submitted for the consideration of the Department of Science Instruction of the National Education Association by its Committee on Policy and Research.

Wilbur L. Beauchamp, University of Chicago; Ralph C. Bedell, State Teachers College, Kirksville, Missouri; Ira C. Davis, University of Wisconsin; Warren W. Knox, Science Supervisor, State of New York; E. Laurence Palmer, Cornell University; Carleton E. Preston, University of North Carolina; Ralph K. Watkins, University of Missouri; Ernest E. Bayles, Chairman, University of Kansas.

The statement is in no sense a set of scientifically settled conclusions. Scientific data can be helpful in the formulation of general policy, but are not (for the present, at least) adequate to serve as a complete basis for a statement of policy. The following proposals represent the present judgment of the Committee as to what conditions should control the teaching of natural science. They are tentative; not final. But we believe that they represent a definite policy which may well be adopted by teachers of science until further thought and research can point the way toward revision and improvement.

1. For the purpose of formulating a teaching program, we accept the ideal of popular democracy, and of individual liberty and dignity consonant with it, as so significant, authentic, and valid a feature of our national tradition that it must become the fundamental setting within which all teaching procedures are conducted. This does not mean that democracy is to be taught, or that propaganda is to be organized in its behalf. It merely means that since our national idealism is democratic in character the classroom must be handled in accordance with democratic principles.
2. Since education implies growth in the direction of betterment, the problem of education is one of seeking to enhance the student's ability and will to participate intelligently in effecting progressive and continuous improvement, both of himself and of his material and social environment. Betterment, improvement, or refinement are terms which must be defined in such a manner as to avoid propaganda in behalf of particular panaceas. We assume that improvement is to be achieved in the degree to which our culture becomes progressively widened in scope and more fully harmonized internally. Improvement lies in the direction of making our tradition richer and more true to itself; of effecting a greater degree of unanimity between the actual and the ideal. Section 8, 9c, 9d, and 11 elaborate this concept.
3. In a study which looks toward the future, a thorough knowledge of present and past is essential. The school curriculum should therefore represent *a study of the common culture or tradition, with a view to its progressive refinement.* The terms culture or tradition are here used in a generic sense. They include the whole of our individual and social inheritance. On the social side they include our common ideals, customs, institutions, and organizations; economic, political, social, etc. On the individual side they include our habits, attitudes, beliefs, acceptances, ideals, etc. "Progressive refinement" is considered as involving (a) the retention of all that holds good and the elimination of all that has become outworn and outmoded, (b) making such additions as will best meet the needs of the new day, and (c) completely remaking the old whenever such steps are evidently necessary.
4. In order to determine what the study of science implies, a definition is demanded. There are two widely used definitions of the term: (a) science as organized and tested *knowledge*, and (b) science as *a method of obtaining* organized and tested knowledge.
   a For the purpose of defining the area of subject matter with which we are principally concerned and within which problems are to be selected for study, we accept the definition of science as organized, tested, and dependable knowledge, and by further confining the study to *natural* science we

*Published in the *1936 Proceedings*, Department of Science Instruction—NEA, pp. 3-7.

limit the area for the most part to natural or material phenomena. However, we would hope that in the course of studying natural phenomena the implications of the interpretations reached would be carried beyond the bounds of natural science, thus seeking the widest possible basis for the harmonization of outlook indicated in sections 8, 9, and 11.

b. For the purpose, however, of determining proper teaching procedures, we must employ the definition of science as *a method* (or a group of related methods) *of arriving at* organized, tested, and dependable knowledge. Instruction in the sciences is thus primarily concerned with the *method* or *methods* of science, and uses the subject matter of science only as a means toward promoting growth in the method. In this sense the science-as-method definition is primary and the science-as-subject-matter definition secondary.

5. The study of science therefore becomes a consideration of the facts, interpretations, and techniques of science, but always with a view to their own refinement and to their use in the improvement of human living.
6. Since the class is to be conducted in accordance with democratic principles, the teacher is not justified, on the one hand, in adopting narrowly propagandic or autocratic means for bringing the student to the acceptance of any preordained set of attitudes, beliefs, or patterns of behavior. Nor is he justified, on the other, in adopting a "hands off" or laissez faire attitude. The teacher must guide without propagandizing; must educate without inculcating. Moreover, it is only by avoiding both extremes that the student may make progress in the development of beliefs scientifically formulated, and of the ability to formulate beliefs scientifically. Thus, for example, even though the democratic conception is basic to our teaching theory, the student is not to be forced to accept this or any other conceptions except through the demands of his own thinking and research. There are recurrent cases, of course, in which the teacher is obliged, in order to safeguard life and property or to preserve the integrity of the learning process, to use coercive measures in forcing non-cooperative pupils to act in accordance with individual and group welfare. But such cases are to be treated as exceptional. The police power is to be applied only if and when the pupil gives evidence of wilful refusal to abide by the dictates of intelligence, and is to be discontinued as soon thereafter as possible. We believe, moreover, that the program which we are here outlining will reduce the necessity for such coercive measures to the minimum.
7. In consequence of the foregoing, it becomes of primary importance that the student be brought to see *knowledge in the making*. His grasp of *knowledge as made* must therefore be not only in terms of the conclusions last reached by scientists, but must also encompass other conclusions which have received, or might have received, acceptance by thoughtful minds, together with the reasons why they are, or should be, rejected. In so far as possible, too, the limitations of the convincing nature of currently accepted interpretations or conclusions must be grasped. Only so can the student's thinking become realistic and scientific.
8. The problem technique of teaching thus becomes vital. The *problem-raising* technique is basically one of seeking points of vagueness, inadequacy, confusion, or conflict in the students' previously accepted concepts. The *problem-solving* technique is likewise one of gathering information and seeking interpretations which will tend to resolve such vaguenesses, inadequacies, confusions or conflicts. Herein lies our major criterion for the selection and treatment of subject matter; a criterion which leads the student to agree, not with some authority as such, nor with no one (no attention being paid to his beliefs), but with himself; a criterion which is in keeping with the democratic conception and the scientific attitude.

Traditionally, science courses have been defined almost entirely on the basis of content requirements. Our proposal is that far greater variability of content be employed in order to meet special local needs, but that whatever content is chosen, it should be taught with a view toward furthering the major objective, of growth in the

ability to obtain knowledge and to arrive at interpretations. This will doubtless mean fewer units or topics covered in the course of a year and retarded speed in the study of the units or topics chosen. But such a policy will doubtless result in a more thorough understanding of principles and a wider knowledge of scientific facts, when viewed over a one-year, two-year, or longer period of time.

9. Several major implications are inherent in the foregoing criterion of subject matter selection and treatment, viz.:
    a. Real teaching usually gets under way only upon the arousal of issues which, so far as the student is concerned, are to a degree controversial. The teacher is entirely justified in presenting, from time to time, settled subject matters purely because the student wants to know, or as preparation for the opening of a problem. Scientific facts will also be marshalled as data to assist in problem solving. But settled matters, studied for their own sake, do not usually challenge the student's mind sufficiently to promote real reflection, nor do they furnish a basis for the significant remaking of beliefs or behavior patterns.
    b. It is highly important that students be genuinely interested in the topics chosen for study, and vitally concerned with the outcomes. Our thesis is that the foregoing program will do much toward making the experiences of students in science classes rich, vital, and realistic.
    c. The general trend of the program is toward the development of a progressively more unified and more intelligent outlook on life, since, although each teaching unit starts with an unsettled issue, it moves through discussion, experimentation, and study toward the settlement of that issue. The problems chosen therefore progressively assume more and more of social significance since it is in that direction that current issues become most problematic and most urgently demand scientific data for their solution.
    d. The "correct" or best solution to any problem is the one which goes furtherest toward harmonizing the conflicting issues at stake. This means that the solution must be not only in harmony with the data, but also with solutions which have been or are being reached in connection with other problems and other fields of thought.
10. The task of aiding students to understand and be able to apply the major interpretative generalizations of science as they contribute to the improvement of living is an essential part of this program, though not an end in itself. This is likewise true of the amassing of scientific facts and data. Whatever may be the immediate objective or objectives of a unit, the unit should always be handled in such a manner as to enhance the *ability to get* information and *to arrive at* principles.
11. The effect of the foregoing program for science instruction is in the direction of stimulating and assisting the student toward becoming an independent learner, while he is at the same time being assisted toward the development of a widened, more appreciative, and more fully harmonized outlook on life, and a heightened competence in carrying on and helping to improve the affairs of life.

APPENDIX II

Roster of NSTA Presidents 1944-74 and Highlight Activities of Their Respective Years
(Here and in all other appendices, the name, institution, and location for each person is given as of the date of service.)

In addition to responsibilities and involvements as implied in this listing of highlights, each President was also engaged in such ongoing activities of the Association as committee endeavors, planning conventions and other meetings, maintaining correspondence with members, and sharing in problems and decisions in the realm of budget, finance, and administration.

1944-45 — Philip G. Johnson, Cornell University, Ithaca, New York

NSTA became a participant in Consumer Education Study of the National Association of Secondary School Principals.

NSTA became a member organization of the Cooperative Committee on the Teaching of Secondary School Science and Mathematics of AAAS.

Administered first NSTA Regional Meetings (other than with NEA in summer and AAAS in winter) in Chicago and New York City Thanksgiving weekend.

The Association supported proposed federal legislation to aid high school science education and for the adoption of the metric system by the United States.

1945-46 — Philip G. Johnson, Cornell University, Ithaca, New York

Task group completed study of *The Place of Science in the Education of the Consumer*, published by NSTA.

NSTA received $2500 grant from Consumer Education Study for project resulting in a publication on *Specifications for Free and Low Cost Materials for Science Teaching*.

NSTA received $1000 grant from Scientific Apparatus Makers Association and developed a report on *Course Content and Teaching Apparatus Used in Schools and Colleges of the United States* (prepared at

behest of the Department of State and with cooperation of the AAAS Cooperative Committee).

NSTA supported recommendations for a National Science Foundation.

NSTA received grant of $3500 from NEA to conduct several NSTA leadership conferences throughout the United States.

1946-47 — Morris Meister, Bronx High School of Science, New York, New York

Conference held with representatives of business-industry, leading to the Packet Service and more than 25 years of ongoing support and cooperation from B-I.

First packet of Business-Sponsored Teaching Aids for Science issued, launching a membership service lasting through 1968 and 80 Packets.

Arrangements completed to set up NSTA office at NEA Center in Washington, D.C.; first staff member employed to operate the Packet Service and maintain NSTA membership records.

Grant of $750 received from General Electric Company to support study of the work week of science teachers.

1947-48 — Morris Meister, Bronx High School of Science, New York, New York

NSTA cooperated with the Safety Commission (NEA) in preparation of a booklet on *Safety Through Elementary Science*.

Evaluative criteria developed for use in selecting materials for the Packet Service.

Advisory Council on Industry-Science Teaching Relations established.

CEDUR program (consultation, evaluation, distribution, utilization research) offered to business-industry in relation to sponsored teaching aids for science.

1948-49 — Norman R.D. Jones, Southwest High School, St. Louis, Missouri

First full-time Executive Secretary (Robert H. Carleton) employed.

NSTA headquarters office and staff of three installed at NEA Center in Washington, D.C.

Teaching Conditions and the Work Week of Science Teachers published; copies sent to 10,000 superintendents of schools throughout the United States.

First Joint Meeting of Science Teaching Societies of the AAAS held in Washington, D.C., helping commemorate the 100th anniversary of founding of AAAS.

Preparation of report of a study, *How Science Teachers Use Business-Sponsored Teaching Aids*.

1949-50 — Nathan A. Neal, Harper and Brothers, New York, New York

NSTA represented at United Nations Conference on Conservation and Utilization of World Resources.

Purchase of *The Science Teacher* from John C. Chiddix, made possible by $4000 long-term, no interest loan by NEA.

Cooperation begun with Teaching Film Custodians to produce classroom science teaching films by excerpting commercially produced (Hollywood) films.

Business-Industry organization formed and accepted as the first Section of NSTA. Arrangements completed for NSTA's first publications for classroom science teachers, a series of seven books of experiments and demonstrations aimed at elementary and junior high levels.

1950-51 — Ralph W. Lefler, Purdue University, West Lafayette, Indiana

Association began publication of *The Science Teacher* under NSTA ownership.

President Truman appoints first National Science Board; NSTA criticizes lack of representation from precollege levels of education.

Thomas A. Edison Foundation contacts NSTA relative to planning a series of institutes on science teaching.

First conversations with American Society for Metals relative to programs of awards for science teachers and students.

Study of school facilities for science instruction launched with supporting grants of $4500 from Scientific Apparatus Makers Association and Hamilton Manufacturing Company.

1951-52 — Arthur O. Baker, Public Schools, Cleveland, Ohio

Approval of plans to launch the *Elementary School Science Bulletin*, a periodical publication for elementary teachers.

First commercial exhibits at an NSTA meeting — 17 "tabletop" displays at $30 each at summer regional conference in Ann Arbor, Michigan.

American Society for Metals inaugurates annual grants of $10,000 to support ASM-NSTA awards for teachers and students, continuing for 20 years in modified forms with various sponsors.

NEA buys Martinique Hotel as a step toward remodeling and building a new center; NSTA moves offices and staff of six into "three hotel rooms and two baths."

Approval of plans for a national convention and several regional meetings each year.

Special elementary science workshop held in cooperation with the University of Michigan during summer regional conference.

1952-53 — Harold E. Wise, University of Nebraska, Lincoln

Special issue of the *Bulletin* of the National Association of Secondary-School Principals, *Secondary School Science Today*, prepared by NSTA committee; 20,000 copies distributed.

NSTA's Future Scientists of America Foundation (FSAF) established.

First national convention held in Pittsburgh, Pennsylvania; 620 registrants, 28 commercial exhibit booths.

NSTA conducts seminar and prepared report on *Science Education in Civil Defense* for Civil Defense Administration.

1953-54 — Charlotte L. Grant, Oak Park High School, Oak Park, Illinois

First offering of FSAF program of summer science-related jobs for science teachers.

First FSAF summer institute for science teachers, supported by $15,000 grant from Crown Zellerbach Foundation.

FSAF student science chart-making contest inaugurated.

1954-55 — Walter S. Lapp, Overbrook High School, Philadelphia, Pennsylvania

Announcement of FSAF summer research assistantships for science teachers.

Advisory Council on Industry-Science Teaching Relations terminated; replaced by Joint Committee on Business-Industry Relations comprised of Executive Committees of NSTA and B-I Section.

Cooperated with Conservation Education Foundation and Joint Council for Economic Education in planning a three-year study in conservation education supported by a $100,000 grant from Resources for the Future, Inc.

First meeting of joint committee with Division of Chemical Education of the American Chemical Society to prepare tests in high school chemistry.

1955-56 — Robert Stollberg, San Francisco State University, San Francisco, California

NSTA cooperates with National Cancer Institute in conducting a special drive-in conference on cancer information and research for 200 teachers.

National Cancer Institute gives $40,000 grant to sponsor STAR (Science Teaching Achievement Recognition) awards for teachers and to print and distribute 30,000 copies of *STAR Ideas for Science Teaching*. (The STAR awards program is still operating in 1974 under sponsorship of the American Gas Association.)

First discussion of proposal to launch *Tomorrow's Scientists*, a publication for junior and senior high school students.

Proposal offered that NSTA establish a high-level Commission on Education in the Basic Sciences.

NSTA accepts invitation to be represented by Stollberg on the U.S. President's National Committee for the Development of Scientists and Engineers.

Stollberg becomes first President to have sabbatical leave (one semester) to devote to Association activities, and thus to participate with planning committees for the National Convention and all Regional Conferences.

1956-57 — John S. Richardson, The Ohio State University, Columbus

Commission on Education in the Basic Sciences was established.

Program of FSAF On-the-Job Research grants for science teachers was authorized.

Plans were made for Summer Research Participation for Teachers (FSAF).

Tomorrow's Scientists, an FSAF publication for students was launched with circulation reaching about 25,000 copies, issued four times a year.

NSTA was invited to be represented on Steering Committee for Physical Science Study (PSSC).

On the Target, a brochure primarily for school administrators and business-industry setting forth facts and figures on secondary school science enrollments and course offerings was published to counteract false and misleading statements in current circulation.

President was appointed to membership on U.S. National Commission for UNESCO.

1957-58 — Glenn O. Blough, U.S. Office of Education, Washington, D.C.

National Cancer Institute extends sponsorship of STAR Awards program for three-year period.

NSTA accepts invitation to be represented on the advisory committee for the NBC-TV program "Continental Classroom."

Interdisciplinary workshop (science and social studies) held at Sarah Lawrence College in cooperation with National Council for the Social Studies and the Joint Council for Economic Education.

NSF grant received to underwrite conference on elementary school science; conference report published as *It's Time for Better Elementary School Science.*

NSTA joins in planning an NEA Council on Instruction.

National Defense Education Act passed by Congress; NSTA President presented testimony in support thereof.

1958-59 — Herbert A. Smith, University of Kansas, Lawrence

First NSTA President to receive financial support

for "time off" for Association duties (one-half of salary for one semester).

National Science Supervisors Association organized; becomes Section of NSTA.

Tomorrow's Scientists merged with *Science World*, published by Scholastic Magazines, Inc.

Commission on Education in the Basic Sciences dissolved because of lack of financial support for significant undertakings.

Scientific Apparatus Makers Association provides grant for conference at Michigan State University and resultant NSTA publication of *Action for Science Under NDEA*.

Proposed Science Island (in Casco Bay, Portland, Maine) as a summer camp and conference center for science students and teachers evaluated and rejected.

1959-60 — Donald G. Decker, Colorado State College, Greeley

NSF grant to NSTA in support of conference on secondary school science; conference report published as *Planning for Excellence in Secondary School Science*.

NSTA and Department of Elementary School Principals (NEA) collaborate on project and publication for parents, *You and Your Child and Science*.

NSTA incorporates under the laws of the District of Columbia.

Committee named to produce policy statement on NSTA's position on the science curriculum K-12.

NSTA drops NEA retirement plan for staff members and enrolls with Teachers Insurance and Annuity Association.

Vistas of Science project started — culminating in a series of 13 publications for youth; done with cooperation and financial support of various scientific organizations; published for NSTA by Scholastic Book Services, Inc.

FSA school science clubs program authorized; in time, over 10,000 chapters enrolled; *Centrifuge* published quarterly as a service to chapters.

First NSTA delegation authorized to attend Glasgow, Scotland, meeting of Science Masters Association (Great Britain).

Proposal accepted to plan and conduct first Summer European Study Tour for Science Teachers (July-August 1961; 32 teachers paying their own way participated).

Association for the Education of Teachers in Science becomes Section of NSTA.

1960-61 — Robert A. Rice, Berkeley High School, Berkeley, California

Invitation from Worldfriends of Great Britain accepted to organize delegations of 20 to 30 11th- and 12th-grade students to attend annual summer Youth Science Fortnight in London; NSTA participation continued 1961 through 1972.

IBM grant of $100,000 received to support project on teaching about computers; *Computers–Theory and Uses* published, more than 100,000 copies distributed during next five years.

Grant of $25,000 from Scientific Apparatus Makers Association accepted to underwrite research study of secondary school science teaching facilities.

NSTA indebtedness to NEA (for loan for purchase of *The Science Teacher* and to cover several years of operating deficits) completely amortized.

President on leave of absence from school district; completed 11,000 miles of "field travel" by automobile through 20 states.

NSTA accepts advisory role to assist educational component of International Geophysical Year (auspices of National Academy of Sciences).

Advisory role accepted to provide NSTA consultation on development of science museum aspect of 1962 Seattle World's Fair, "Century 21." (Rice served on staff of this project four months in 1961-62.)

1961-62 — J. Darrell Barnard, New York University, New York, New York

Arrangements completed for Ford Motor Company to sponsor FSA student awards program with annual grants of $25,000 (this arrangement persisted for five years).

NSTA named to representation on Specialized Committee on Science of World Confederation of Organizations of the Teaching Profession; provided

secretariat for the committee for five years until it was terminated.

Publications Committee completely reorganized; given new charge, increased responsibilities, and wide latitude for action.

First Conference for Delegates of Science Teacher Organizations (mostly NSTA state chapters and affiliated groups) held in conjunction with NSTA Board of Directors annual business meeting.

Curriculum Committee proposal approved to convene a conference of scientists and science educators to develop a statement on "conceptual schemes of science" with instructional suggestions; this endeavor culminated in publication of *Theory Into Action in Science Curriculum Development*; more than 30,000 copies printed and distributed.

Initiated Bylaw revision to eliminate Executive Committee positions of Secretary and Finance Officer (transferring their duties to the Executive Secretary) and replace with four Members-at-large.

1962-63 — John H. Marean, Reno High School, Reno, Nevada

NSTA provided salary for substitute help to enable the President to have special schedule and about half time off during his year in office.

Proposal approved to launch an elementary science journal, *Science and Children*, to replace the *Elementary School Science Bulletin*.

National Cancer Institute grant in excess of $100,000 received for purpose of producing a series of six science career guidance films.

Grant of $50,000 received from NASA to underwrite production of six publications in a series titled *Helping Children Learn Science*, designed to provide information and teaching tips for elementary teachers; published for NSTA by Teachers Publishing Corporation; more than 100,000 copies distributed.

1963-64 — Stanley E. Williamson, Oregon State University, Corvallis

First series of Youth Science Congresses organized and held with financial support ($80,000) and cosponsorship of National Aeronautics and Space

Administration. (This program continued through 1970.)

Council for Elementary Science International affiliates as a Section of NSTA.

Arrangements concluded with NEA for $15,000 long-term loan to enable launching *Science and Children*.

First discussion of "Now that we have *The Science Teacher* and soon *Science and Children*, why not launch an NSTA journal for college teachers of science?"

Conclusion by Williamson of international surveys of science teacher education and science teaching facilities for Specialized Committee on Science of WCOTP.

1964-65 — Helen E. Hale, Baltimore County Public Schools, Towson, Maryland

First NSTA specialized conference for college science teachers, held with cooperation of Pennsylvania Academy of Science.

NASA grant of $6,000 received to support a project to develop teaching content and suggestions for aerospace science at junior high school level.

Total sales of Vistas of Science books passes the half million mark.

NSTA participates in conference in Manila, the Philippines, for science education specialists from 14 Asian countries and Australia.

NSTA-Exhibitors Group formed to cooperate in formulating and enforcing guidelines for commercial exhibits at conventions of the Association.

STAR awards program, dormant for lack of finance and sponsor, reactivated with modest support from NSTA internal budget.

First NSTA venture in co-sponsoring an international meeting, a regional conference in Banff, Alberta, Canada.

1965-66 — James V. DeRose, Marple Newtown Senior High School, Newtown Square, Pennsylvania

National Association for Industry-Education Cooperation formed as successor to B-I Section.

Program established to bestow NSTA Citations for Distinguished Service to Science Education.

Contributed papers sessions introduced as component of National Convention, also Science Seminars as a form of continuing education for teachers.

U.S. Office of Education grant of $60,000 enables special committee to pursue elaboration of *Theory Into Action* and develop instructional suggestions.

Sponsorship and financing ($5,000) of annual STAR Awards for science teachers assumed by American Gas Association.

Proposal and recommendation for a continuing Committee on Issues of Great Concern to science teachers.

Commission appointed to develop a nationwide program for observance of NSTA's Silver Anniversary Year, 1968-69.

President DeRose becomes first precollege teacher to serve as a member of U.S. National Commission for UNESCO.

1966-67 — Addison E. Lee, The University of Texas, Austin

Launching of a continuing series of one-day "grass roots" meetings throughout the United States, variously called drive-in conferences and Saturday Seminars.

Board of Directors resolves to resist growing pressure from NEA on affiliated Departments to require NEA membership as prerequisite to Department (NSTA) membership.

Sun Oil Company begins sponsorship of National Convention Science Seminars with annual grants of $10,000.

Registered attendance at nine Regional Conferences tops 7600 and exceeds 6600 at National Convention (peak year to date for combined total at all meetings of the Association).

NSTA joins with NEA Defense Commission to fight attacks on and dismissals of biology teachers for teaching evolution (the Gary Scott case in Tennessee and the Susan Epperson case in Arkansas).

Decision to "go it alone" (without NSF grant) in compiling and administering annual U.S. Registry of

Secondary School Science and Mathematics Teaching Personnel, also to plan extension of the Registry to include social studies teachers.

1967-68 — Morris H. Shamos, New York University, New York, New York

NSTA participates in ABC (America, Britain, Canada) International Curriculum Conference in Oxford, England.

Board of Directors adopts sabbatical leave plan for NSTA staff (first such document among all NEA departments).

Damon Foundation endows keynote address at National Conventions with $1500 per year.

NSTA-Gustav Ohaus Awards for teachers established with financial support of Ohaus Scale Corporation.

Packet Service terminated after 20 years and 80 Packets because of dwindling supply of business-sponsored teaching materials.

NSTA News-Bulletin for members established.

Affiliation with NEA changed from status as a Department to that of Associated Organization.

Capital Fund Campaign proposed to raise money to establish (build or buy) NSTA's own headquarters center in Washington, D.C.

NSTA acted as co-sponsor of a move to abolish restrictive state laws inhibiting the freedom of science teachers to present their views of the origin of life.

1968-69 — Elizabeth A. Simendinger, The Wheatley School, Old Westbury, New York

Silver Anniversary Year program carried out — more than 50 Silver Symposia, with total attendance more than 5000; Silver Year Review published; *Designs for Progress in Science Education* published.

Authorization given by Board of Directors for planning an NSTA journal for college science teachers.

Approval granted to offer programs of insurance for members.

Committee on Science for the Disadvantaged established.

Commission on Professional Standards and Practices appointed; in time, produced two publications, *Conditions for Good Science Teaching* and *Annual Self-Inventory for Science Teachers*.

NSTA participated in conference on education for metrication sponsored by U.S. National Bureau of Standards.

1969-70 — Alfred B. Garrett, The Ohio State University, Columbus

Approval of plan to borrow $30,000 from members to underwrite launching *Journal of College Science Teaching*. (About 55 members provided $45,000 for this purpose.)

NSF grant of $87,000 received for nationwide study of exemplary science teaching facilities, culminating in a filmstrip with cassette tape and the publication, *Facilities for Secondary School Science Teaching*.

Educational Technology study completed under grant of $140,000 from U.S. Office of Education.

Standard Oil Company (New Jersey) agrees to sponsor Tomorrow's Scientists and Engineers student awards program for three years with annual grants of $100,000; Scholastic Magazines and Engineers Council for Professional Development cooperate as co-sponsors.

President Garrett represents the Association at national meeting of the Australian Science Teachers Association, giving the keynote address.

NSF grants assured for support of special workshops, field trips, and seminars in science at NSTA Regional Conferences; approximately $20,000 per year for three years.

Poll of NSTA members shows 8 to 1 support of disaffiliation with NEA and setting up independent headquarters elsewhere if relations with NEA worsen to critical level.

1970-71 — Richard J. Merrill, Mt. Diablo School District, Concord, California

Proposal approved to replace eight or nine regional conferences with three area conventions, each year supplemented by several local drive-in conferences.

Prentice-Hall publishing company provides annual support of $1,000 for seminar on science for the disadvantaged at the National Convention.

Black Caucus of 50 to 80 Negro members (mostly) loosely organized; NSTA Board of Directors approves inviting an official nonvoting representative to attend each Board meeting.

Curriculum Committee report, *School Science Education for the 70's* accepted; adopted by Board of Directors as official up-to-date position statement on science curriculum development.

Continuing joint committee of NSTA and CESI approved by both groups with responsibility and budget to develop programs and services for elementary school science and teachers.

Approval of NSTA cooperation with Allegro Films organization to produce a series of classroom films under series title *Science Screen Report*.

Final decision by Board of Directors to proceed with publication of the *Journal of College Science Teaching*.

1971-72 — Morris R. Lerner, Barringer High School, Newark, New Jersey

Proposal approved to develop a Packet Service for elementary members, a resumption of the evaluation and distribution of business-sponsored instructional materials.

NSTA becomes member organization of the Alliance for Environmental Education.

NSTA conducts a survey on the teaching of nuclear energy in secondary schools; supported by a grant of $11,000 from the Atomic Industrial Forum, Inc.

New (re-established) advisory committee formed to counsel on business-industry-NSTA relations.

Approval granted by the Board for a project to develop guidelines, criteria, and documents for doing a self-assessment of secondary school science

programs; funding provided by the Fels Foundation, five business-industry organizations, and the Association.

Cooperation with NSF authorized to distribute a series of classroom science teaching films.

Council of State Science Supervisors accepted as a Section of NSTA.

Testimony offered by Morris R. Lerner to committees of the U.S. Senate and the House in support of increased budget for NSF.

Committee authorized to conduct a search for a successor to the Executive Secretary, scheduled to retire about one year hence.

1972-73 — Elaine W. Ledbetter, Pampa Senior High School, Pampa, Texas

President Ledbetter designs an IMPACT program (Increasing Membership, Participation, Activity, Communication, Trust) and, on leave from teaching, travels 70 percent of the year visiting and conferring with teachers and groups in 25 states.

New NSTA Executive Director (change in title from Executive Secretary) employed — Robert L. Silber of the American Chemical Society staff in Washington, D.C.

President Ledbetter represents the Association at a conference resulting in the formation of the International Council of Associations for Science Education; she is chosen to represent North America on the first Executive Committee of ICASE.

The Robert H. Carleton award established by the Board of Directors; to be given on occasions, not necessarily annually, to honor members who have demonstrated exceptional national leadership in science education.

Task force project on critical review and evaluation of science component of National Assessment of Educational Progress completed under grant of $35,000 from U.S. Office of Education; report made ready for publication.

1973-74 — Leslie A. Trowbridge, University of Northern Colorado, Greeley

The IMPACT program continued, but expanded to include CADRE-100, a group of approximately 100 volunteers offering to help encourage membership and promote Association endeavors.

Cooperation with Charles Scribner's Sons, publishers, approved to produce and market a 1975 *Science Calendar* as an aid to public understanding of science.

NSTA is assured of grants from NSF, USOE, and the Federal Energy Administration to enable the Association to do a study of innovative project activities in science, grades 7-12, and to prepare a series of energy-environment materials for science and social studies K-12; also, NASA provides grant in support of the Viking Lander project.

Self-assessment project completed; documents providing guidelines and means for doing a school self-assessment made ready for publication.

Total attendance at NSTA meetings during this year approaches 15,000, including 5100 at the National Convention, 4100 at three Area Conventions, and more than 5000 at 29 one-day, drive-in conferences.

Special committee searches for a new headquarters building for the Association; locates and recommends purchase of the Jewett mansion at 1742 Connecticut Avenue, NW, Washington, D.C.

Board of Directors votes to terminate affiliation with NEA, purchase the Jewett mansion, and relocate the headquarters office; financial arrangements through three Washington banks completed, NSTA moves to its own new home by the end of July 1974.

APPENDIX III

Roster of NSTA Boards of Directors 1944-74

1944-45

President
Philip G. Johnson, Cornell University, Ithaca, New York
General Vice-Presidents
Morris Meister, Bronx High School of Science, New York, New York
Norman R.D. Jones, Southwest High School, St. Louis, Missouri
Regional Vice-Presidents
(Western) W. Bayard Buckham, Oakland (California) High School
(North Central) Fred W. Moore, Senior High School, Owosso, Michigan
(Southern) Greta Oppe, Ball High School, Galveston, Texas
(Eastern) Ethel Ramsden, State Teachers College, Montclair, New Jersey
Recording Secretary
Deborah Russell, State Teachers College, Framingham, Massachusetts
Corresponding Secretary
Nathan A. Neal, Cleveland (Ohio) Public Schools
Treasurer
Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania
Directors
Maurice U. Ames, Board of Education, New York, New York (representing the Federation of Science Teacher Associations of New York City)
Florence Billig, Wayne University, Detroit, Michigan (representing the National Association for Research in Science Teaching)
John C. Hogg, Phillips Academy, Exeter, New Hampshire (representing the New England Association of Chemistry Teachers)
Emil L. Massey, Board of Education, Detroit, Michigan (representing the Central Association of Science and Mathematics Teachers)
W.H. Michner, Purdue University, West Lafayette, Indiana (representing the American Association of Physics Teachers)

Laurence L. Quill, Michigan State College, East Lansing, Michigan (representing the Division of Chemical Education, American Chemical Society)

Merl A. Russell, Biology Teacher, Royal Oak, Michigan (representing the National Association of Biology Teachers)

Reuben T. Shaw, Northeast High School, Philadelphia, Pennsylvania (representing the Association of Science Teachers of the Middle States and Maryland)

Dwight E. Sollberger, State Teachers College, Indiana, Pennsylvania (representing the American Nature Study Society)

Paul R. Young, Board of Education, Cleveland, Ohio (representing the School Garden Education Section of NEA)

1945-46

President

Philip G. Johnson, Cornell University, Ithaca, New York

General Vice-Presidents

Morris Meister, Bronx High School of Science, New York, New York

Norman R.D. Jones, Southwest High School, St. Louis, Missouri

Regional Vice-Presidents

(Western) W. Bayard Buckham, Oakland (California) High School

(North Central) Fred W. Moore, Senior High School, Owosso, Michigan

(Southern) Greta Oppe, Ball High School, Galveston, Texas

(Eastern) Robert H. Carleton, Summit (New Jersey) High School

Recording Secretary

Deborah Russell, State Teachers College, Framingham, Massachusetts

Corresponding Secretary

Nathan A. Neal, Cleveland (Ohio) Public Schools

Treasurer

Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania

Directors

Maurice U. Ames, Board of Education, New York, New York (representing the Federation of Science Teacher Associations of New York City)

Florence Billig, Wayne University, Detroit, Michigan (representing the National Association for Research in Science Teaching)
Leo J. Fitzpatrick, Brockton (Massachusetts) High School (representing the New England Physics Teachers Association)
John C. Hogg, Phillips Academy, Exeter, New Hampshire (representing the New England Association of Chemistry Teachers)
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Reuben T. Shaw, Northeast High School, Philadelphia, Pennsylvania (representing the Association of Science Teachers of the Middle States and Maryland)
Dwight E. Sollberger, State Teachers College, Indiana, Pennsylvania (representing the American Nature Study Society)
Paul R. Young, Board of Education, Cleveland, Ohio (representing the School Garden Education Section of NEA)

1946-47

President
Morris Meister, Bronx High School of Science, New York, New York
General Vice-Presidents
Norman R.D. Jones, Southwest High School, St. Louis, Missouri
Nathan A. Neal, Cleveland (Ohio) Public Schools
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(North Central) Ralph W. Lefler, Purdue University, Lafayette, Indiana
(Southern) Greta Oppe, Ball High School, Galveston, Texas

(Eastern) Reuben T. Shaw, Northeast High School, Philadelphia, Pennsylvania (representing the Association of Science Teachers of the Middle States and Maryland)

Secretary

Hanor A. Webb, George Peabody College for Teachers, Nashville, Tennessee

Treasurer

George W. Rawlins, Woodrow Wilson High School, Washington, DC

Directors

Emil L. Massey, Board of Education, Detroit, Michigan (representing the Central Association of Science and Mathematics Teachers)

Paul R. Young, Board of Education, Cleveland, Ohio (representing the School Garden Education Section of NEA)

Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania

Leo J. Fitzpatrick, Brockton (Massachusetts) High School (representing the New England Physics Teachers Association)

Laurence L. Quill, Michigan State College, East Lansing, Michigan (representing the Division of Chemical Education, American Chemical Society)

Merl A. Russell, Biology Teacher, Royal Oak, Michigan (representing the National Association of Biology Teachers)

Reuben T. Shaw, Northeast High School, Philadelphia, Pennsylvania (representing the Association of Science Teachers of the Middle States and Maryland)

Dwight E. Sollberger, State Teachers College, Indiana, Pennsylvania (representing the American Nature Study Society)

Paul A. Brandwein, Forest Hills (New York) High School (representing the Federation of Science Teacher Associations of New York City)

Earl R. Glenn, State Teachers College, Montclair, New Jersey (representing the National Association for Research in Science Teaching)

Lloyd W. Taylor, Oberlin College, Oberlin, Ohio (representing the American Association of Physics Teachers)

Elbert C. Weaver, Phillips Academy, Andover, Massachusetts (representing the New England Association of Chemistry Teachers)
Philip G. Johnson, US Office of Education, Washington, DC
Harold E. Wise, University of Nebraska, Lincoln
Ellsworth S. Obourn, John Burroughs School, Clayton, Missouri

1947-48

President
Morris Meister, Bronx High School of Science, New York, New York
Vice-President
Norman R.D. Jones, Southwest High School, St. Louis, Missouri
Regional Vice-Presidents
(Western) W. Bayard Buckham, Oakland (California) High School
(North Central) Ralph W. Lefler, Purdue University, Lafayette, Indiana
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Treasurer
Nathan A. Neal, Cleveland (Ohio) Public Schools
Directors
Arthur O. Baker, Cleveland (Ohio) Public Schools (representing the Central Association of Science and Mathematics Teachers)
Francis Miner, Brooklyn Botanical Garden (representing the School Garden Education Section of NEA)
Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania
Leo J. Fitzpatrick, Brockton (Massachusetts) High School (representing the New England Physics Teachers Association)

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Laurence L. Quill, Michigan State College, East Lansing, Michigan (representing the Division of Chemical Education, American Chemical Society)
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Elbert C. Weaver, Phillips Academy, Andover, Massachusetts (representing the New England Association of Chemistry Teachers)
Philip G. Johnson, US Office of Education, Washington, DC
Harold E. Wise, University of Nebraska, Lincoln
Ellsworth S. Obourn, John Burroughs School, Clayton, Missouri
Charlotte L. Grant, Oak Park (Illinois) High School

1948-49

President
Norman R.D. Jones, Southwest High School, St. Louis, Missouri
President-Elect
Nathan A. Neal, Harper and Brothers, New York, New York
Retiring President
Morris Meister, Bronx High School of Science, New York, New York
General Vice-President
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Glenn O. Blough, US Office of Education, Washington, DC

Paul A. Brandwein, Forest Hills (New York) High School

Robert H. Carleton, Michigan State College, East Lansing, Michigan (resigned in August 1948 to become Executive Secretary of the Association)

Ira C. Davis, University of Wisconsin, Madison (replacing Robert H. Carleton)

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Earl R. Glenn, State Teachers College, Montclair, New Jersey

Charlotte L. Grant, Oak Park (Illinois) High School

Elmer Headlee, Kirkwood High School, Missouri

Philip G. Johnson, US Office of Education, Washington, DC

Elizabeth Lockwood, Harvard School of Public Health, Boston, Massachusetts

Francis Miner, Brooklyn Botanical Garden

Hugh C. Muldoon, Duquesne University, Pittsburgh, Pennsylvania

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1971-72

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X. Leslie W. Trowbridge, University of Northern Colorado, Greeley
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VIII. David L. Fagle, Marshalltown Community School District, Marshalltown, Iowa

IX. Jesse A. Dorrington, Clear Creek Schools, League City, Texas
X. John M. Akey, Scott Carpenter Planetarium and Mitchell High School, Colorado Springs, Colorado
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X. John M. Akey, Scott Carpenter Planetarium and Mitchell High School, Colorado Springs, Colorado
XI. John S. Shrader, Central Washington State College, Ellensburg
XII. Clifford T. Fredrickson, San Diego City Schools, California

APPENDIX IV

NSTA National Conventions 1953-74

Dates and locations of the Conventions are followed by the names of the President and Program Chairman for each, the theme of that Convention, the keynote speaker, and the round-number total attendance.

1953 — March 19-21, Pittsburgh, Pennsylvania; Harold E. Wise, Nathan A. Neal; "Science Instruction, 1953"; Edward U. Condon, *Director of Research,* Corning Glass Works, and *President,* American Association for the Advancement of Science; 620.

1954 — April 1-3, Chicago, Illinois; Charlotte L. Grant, Ralph W. Lefler; "Science Instruction, 1954"; Harlan Hatcher, *President,* University of Michigan; 900.

1955 — March 24-26, Cincinnati, Ohio; Walter S. Lapp, Louise E. Lyons; "More Realistic Science Teaching — Toward What Ends?" Ralph W. McDonald, *Executive Secretary,* Association for Higher Education (NEA); 1,000.

1956 — March 14-17, Washington, D.C.; Robert Stollberg, Henry A. Shannon; "Problem Solving: How We Learn"; Herold C. Hunt, *Commissioner of Education,* U.S. Office of Education; 1200.

1957 — March 20-23, Cleveland, Ohio; John S. Richardson, James G. Harlow; "New Frontiers for Science Teachers"; Arthur S. Flemming, *President,* Ohio Wesleyan University, and former *Director,* Office of Defense Mobilization; 1,300.

1958 — March 26-29, Denver, Colorado; Glenn O. Blough, Donald G. Decker; "Improving Classroom Science Teaching"; Glenn O. Blough, *Associate Professor of Elementary Science Education,* University of Maryland; 1600.

1959 — March 31-April 4, Atlantic City, New Jersey; Herbert A. Smith, Helen E. Hale; "Science Education for America: An Appraisal and Look Ahead"; Panel Discussion; 1700.

1960 — March 29-April 2, Kansas City, Missouri; Donald G. Decker, Mildred Ballou and Dorothy T. Tryon; "Current Science and the K-12 Program"; Donald G. Decker, *Dean of the College,* Colorado State College; 1900.

1961 — March 24-29, Chicago, Illinois; Robert A. Rice, Oreon Keesler; "The Science Teacher: Seeking Excellence in An Age of Science"; Henry Eyering, *Dean,* the Graduate School, and *Professor of Chemistry,* University of Utah; 2700.

1962 — March 9-14, San Francisco, California; J. Darrell Barnard, Elizabeth A. Simendinger; "Science Teaching for the Learner"; Ralph W. Tyler, *Executive Director*, Center for Advanced Study in the Behavioral Sciences; 2500.

1963 — March 29-April 3, Philadelphia, Pennsylvania; John H. Marean, Ruth E. Cornell; "Science, Science Teaching, and Society"; Barry Commoner, *Professor of Plant Physiology*, Washington University (St. Louis); 2700.

1964 — March 20-24, Chicago, Illinois; Stanley E. Williamson, James A. Rutledge; "The Science Teaching Enterprise and the Educative Process"; Robert S. Cohen, *Chairman*, Department of Physics, Boston University; 3800.

1965 — March 27-31, Denver, Colorado; Helen E. Hale, Rose Lammel; "Science Teaching Today: Dimensions of the Task"; Gerald Holton, *Professor of Physics*, Harvard University; 3,000.

1966 — April 1-5, New York, New York; James V. DeRose, Morris H. Shamos; "Science: Content, Communication, Controversy"; Richard P. Feynman, *Professor of Theoretical Physics*, California Institute of Technology; 6200.

1967 — March 17-21, Detroit, Michigan; Addison E. Lee, Elaine W. Ledbetter; "Interactions of Scientists, Science Teachers, and Science Students"; H. Bentley Glass, *President*, State University of New York at Stony Brook; 6600.

1968 — March 29-April 2, Washington, D.C.; Morris H. Shamos, Leo Schubert; "Science: The New Humanism"; Jacob Bronowski, *Senior Fellow*, The Salk Institute for Biological Studies; 6800.

1969 — March 21-25, Dallas, Texas; Elizabeth A. Simendinger, John Rosemergy; "Horizons for the 70's and Science Education"; Edward L. Tatum, The Rockefeller University; 3800.

1970 — March 13-17, Cincinnati, Ohio; Alfred B. Garrett, Phyllis L. Magat; "Science Teaching Toward the World We Want"; Philip Handler, *President*, National Academy of Sciences; 5400.

1971 — March 26-30, Washington, D.C.; Richard J. Merrill, J. David Lockard; "Decision Making in Science Education — Selection, Implementation, Evaluation"; John L. Goodlad, *Dean*, Graduate School of Education, University of California at Los Angeles; 7,000.

1972 — April 7-11, New York, New York; Morris R. Lerner, Fred Blumenfeld; "Alternatives *in* Science! OR Alternatives

to Science?"; Philip Morrison, *Professor of Physics,* Massachusetts Institute of Technology; 7500.

1973 — March 30-April 3, Detroit, Michigan; Elaine W. Ledbetter, Earl J. Montague; "Bridges to the 21st Century Through Science Education"; Shirley Chisholm, *Congresswoman,* Twelfth Congressional District of New York; 6400.

1974 — March 15-19, Chicago, Illinois; Leslie W. Trowbridge, Earl A. Sargent; "1984 Minus Ten and Counting"; Daniel Bell, *Professor of Sociology,* Harvard University; 5400.

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The designation AIII following a name indicates that the name will be found in Appendix III, Roster of NSTA Boards of Directors 1944-74.

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ROBERT H. CARLETON has served the profession of science education with distinction for forty-two years. Elected to Phi Beta Kappa at two major universities while doing undergraduate and graduate work in science education, Mr. Carleton has contributed significantly to his professional field during a distinguished career as high school teacher, university professor, and as Executive Secretary of the world's largest organization devoted to the teaching of science, the National Science Teachers Association, in which capacity he has served for twenty-five years.

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